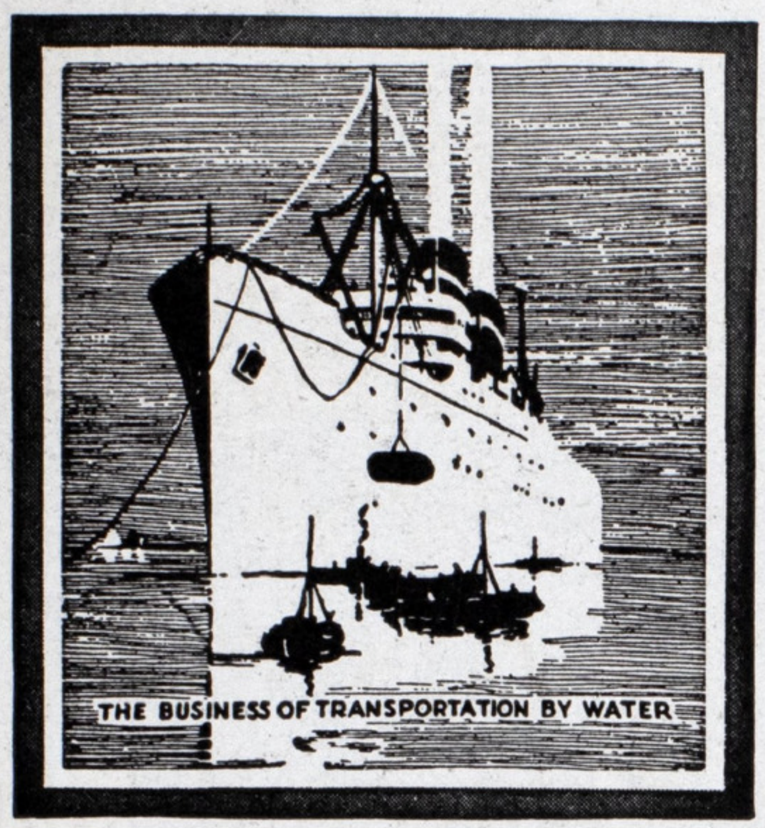
Marine Review

The National Publication Covering the Business of Transportation by Water

CLEVELAND **FOUNDED 1878** **NEW YORK**



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The A. B. P. is a nonprofit organization whose members have pledged themselves to a working code of practice in which the interests of the men of American industry, trade and professions are placed first—a code demanding unbiased editorial pages, classified and verified paid subscribers, and honest advertising of dependable products.

A PROGRESSIVE RECORD *in* *Marine Engineering*

WITH the pioneer installation of the marine geared turbine in the United States Navy Collier Neptune in 1911, Westinghouse made its initial contribution to American marine engineering—a contribution that was to revolutionize ship propulsion. And during the score of years that have followed, Westinghouse has continued to contribute conspicuously in this engineering field.

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Illustrated on these pages are views of typical Westinghouse geared turbine, turbine electric and Diesel electric propulsion installations, exemplifying the wide scope and progressiveness of Westinghouse marine engineering.

CONTRIBUTIONS

* * * *

Marine Geared Turbine
Improved Steam Jet Air Ejector
Underneath Condenser
Propeller Type Blower
Diesel Electric Drive
High Speed Cargo Winch Motor and Control
Propeller Type Pump
Low-Pressure Turbine Geared to Reciprocating Engine (special design)
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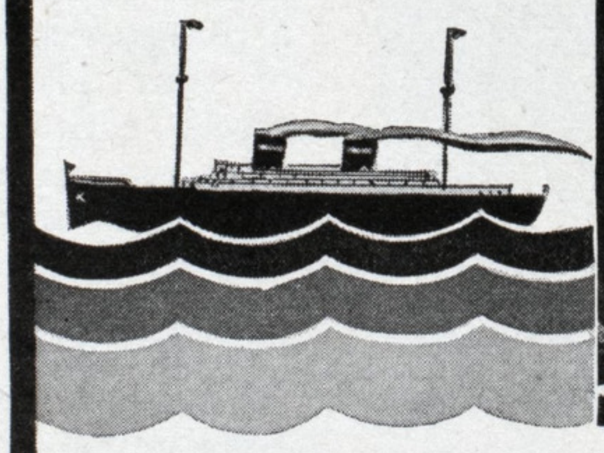

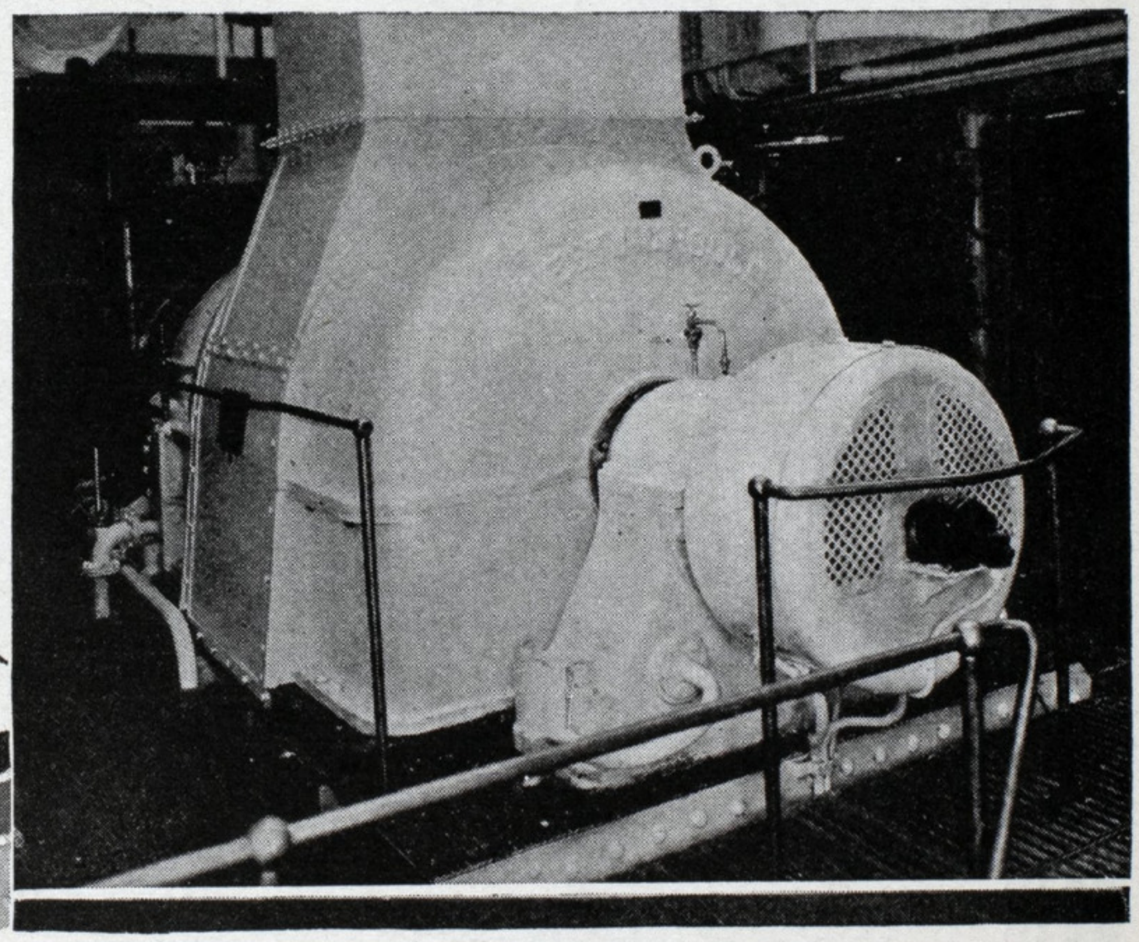

The main turbine generator of the 3,000 s.h.p. turbine electric Coast Guard Cutter Chelan, one of ten which Westinghouse has equipped with this type of drive for the Coast Guard service. Westinghouse turbine electric propulsion equipment of more than 26,000 s.h.p. is also being installed in a new Dollar liner now under construction.

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Ship owners, operators, shipbuilders, naval architects and marine engineers find the Distinctive Ship Number of Marine Review of greatest usefulness, because it gives them in one place, under one cover, the most definite and accurate information on every type of ship recently completed. The following quotations from letters received demonstrate the practical value of this issue.

Shipyard Vice president:

"The information contained in your April Distinctive Ship issue and manner of presentation are very remarkable and useful."

Prominent steamship manager:

"Your Distinctive Ship issue showing various types of vessels with concise descriptions we consider particularly useful as a reference volume."

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"I think the section devoted to Distinctive Ships of special interest and valuably informative."

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This important and exclusive presentation of up-to-date American shipbuilding data is of unusual interest to every responsible person connected with the marine trade.

All the Distinctive Ships and shipbuilding information is grouped in an insert section printed on high quality india tint coated paper. Duotone ink is used, giving a rotogravure effect. The attention value of your advertisement appearing in this insert section is apparent. Many concerns each year take advantage of this outstanding opportunity to tell about their products and service in an effective way. Only full pages appear in the insert section. Early reservation of space is suggested, copy to reach us on or before March 16. The Distinctive Ship Number is out on April 1.

Marine Review

220 Broadway
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Cleveland, Ohio

« EDITORIAL »

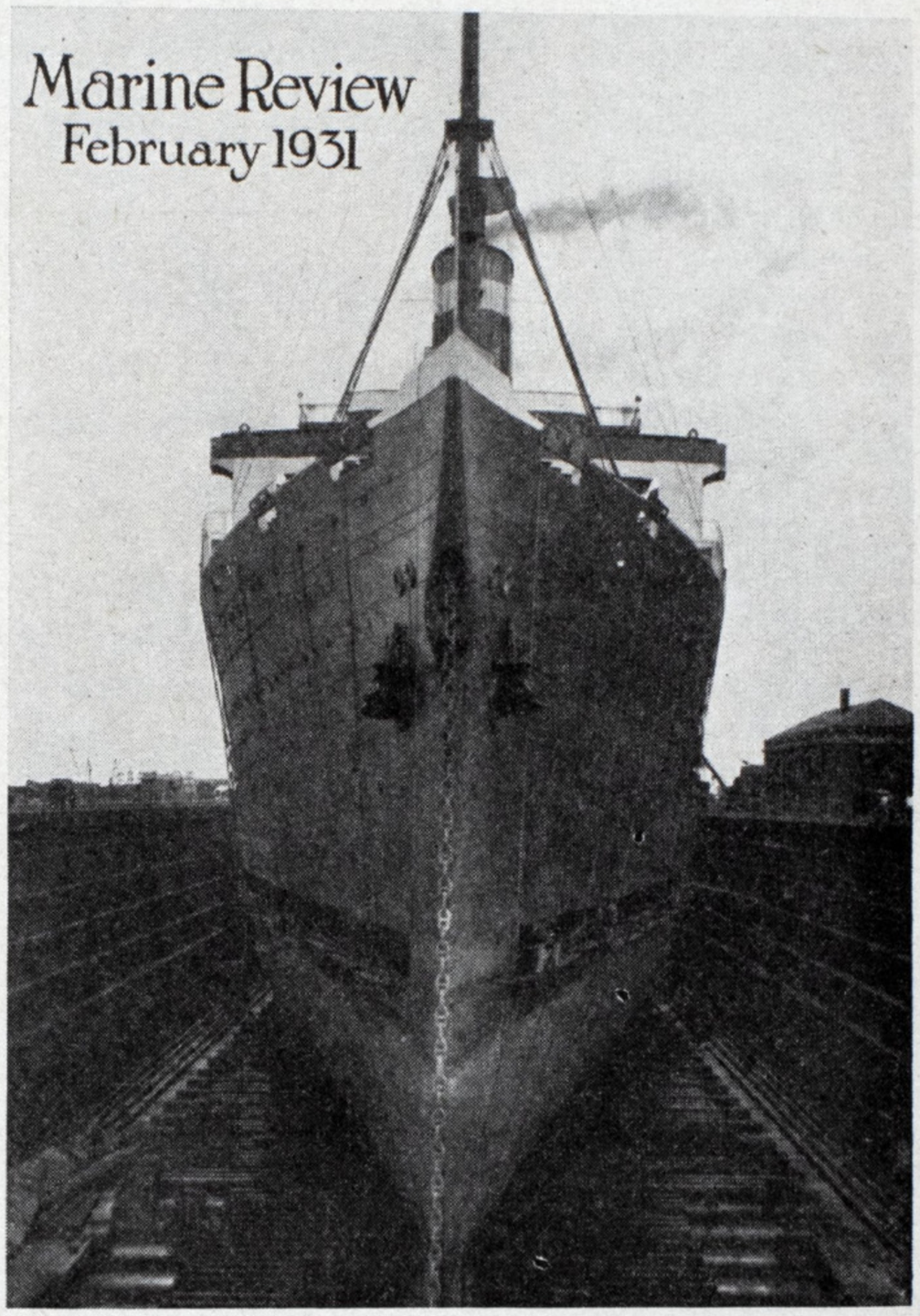
Panama Canal Water Lines Must Not Be Destroyed

THE welfare of the railroads of the country is a matter of concern to every individual. It would be folly for the most ardent advocate of water transportation to belittle the place of the railroads as an essential arm of business. Everything should be done by the management of the railroads themselves, by the government and by the public to overcome by wise and energetic measures the difficulties now surrounding them.

One of these measures, however, should distinctly not be to deliberately place in the hands of the railroads a weapon designed purely to cut down a sister agency of transportation. To allow railroads to quote rates for through traffic to the West coast at less rates than to intermediate points, and economically entirely unjustified, would have the immediate effect of tending to destroy the business of the water lines through the Panama canal and would soon have the effect of making business suffer with increase of rates.

Rates intended solely to kill off a competitor are not based on cost of rendering service and therefore are economically fallacious. Cost of rendering service must invariably determine the tariff. All the argument and warm-hearted advocacy in the world will not save a railroad line or any other business if equal or better service can be rendered by some other agency at less cost.

The railroads could show their good faith, in going to the interstate commerce commission for relief, by not only suggesting lower rates for through traffic, which can be served by water transportation, but also lower rates to all the intermediate points which cannot be served by water transportation and which must depend solely on the railroads. The ultimate test



Leviathan in Commonwealth Dry Dock Boston

even of private business must be not the protection of any individual's good will and volume of business at any cost but rather the need that the consumer finds in having this business continue. The people of the United States as the consumer, in this case, of the service of the railroads still strongly feels the need of the service rendered and is willing to pay a fair amount for it, but will not consider choking off another and a more economical mode of transportation merely to continue regardless of economics, the same volume of business for the railroads.

The problem of the railroads no doubt is acute. It needs serious thought and vigorous action, but the worst imaginable way to begin is to ask the interstate commerce commission for a sharp knife which can be thrust into the heart of the Panama canal water lines.

A $300,000,000 Program in Sight for Shipbuilders

By A. H. Jansson

THOUGH the volume of merchant shipbuilding under construction in the principal maritime countries of the world as of Dec. 31, 1930 was lower than at any time since the end of 1926, the shipyards of the United States were building nearly 85,000 tons more than they were before the war; while for the quarter ended Dec. 31, last, American shipyards show a gain in work on hand of about 20,000 gross tons. The volume for the same period for Great Britain and Ireland alone shows a decrease of 207,000 tons. In this quarter Great Britain and Ireland were building 39 per cent of world construction as against more than one-half at the end of 1929. On the other hand the United States share in world shipbuilding advanced from 8.3 per cent at the end of last September to practically 10 per cent at the end of the year.

These statistics clearly show the effect of the revival in shipbuilding which has come about in the United States principally through the direct effect of the merchant marine act of 1928. In awarding mail contracts under this law stipulations have been made for the building of new ships within specified periods of time. This program is now well under way.

We have published from time to time complete summaries of mail contracts awarded. The last summary up to Oct. 15, 1930 will be found in the last November issue page 76. To make clear what this shipbuilding program really amounts to we have tabulated the shipbuilding now going on leaving out work which is practically completed. The work may be divided into four separate categories.

1. That which has been definitely contracted for and on which the shipyards have commenced work or about to commence work.

2. A list of new ships on which bids have been received or asked for and others which must be contracted for in due course.

3. A list of vessels, construction of which is likely to be called for within the period of the mail contracts.

4. A tabulation of recently let contracts which have nothing whatever to do with mail contracts.

These results are noted in Tables 1 to 4 inclusive. All of the above is based on actual work or definite prospects and represents a large volume of shipbuilding. It is clear, however, that in addition to this definite work the need for replacements and expansion of existing fleets in domestic and foreign service must in the nature of things soon call for still more shipbuilding. The large war fleet is ageing and is obsolescent. Vessels in the fleets of our domestic coastwise trade are of a high average age. It is significant that no freight ships as such are included in the shipbuilding now under way nor has there been any building recently of this type of vessel. Since the average life of a ship is perhaps not much over 20 years, replacements of the existing fleet cannot long be deferred. Present shipbuilding facilities in the United States may therefore look forward with optimism to the years to come. A total of over $300,000,000 in shipbuilding is now in hand and in sight. This involves at least 87 steel powered ships ranging in size all the way from the new United States liners of over 700 feet in length to a fireboat for the City of

Table I

Merchant Shipbuilding

Ships Under Construction and Contracts Let on Mail Awards as of Jan. 5, 1931

Owner	Builder	Cost	Details	Gross Tonnage
Export S. S. Co.	New York S. B. Co.	$3,000,000	Str. Exeter—Keel Aug. 11, 1930	8,700
Export S. S. Co.	New York S. B. Co.	3,000,000	Str. Excambion—Keel Oct. 25, 1930	8,700
United States Lines	New York S. B. Co.	11,000,000	Keel Dec. 6, 1930—Delivery July, 1932	30,000
United States Lines	New York S. B. Co.	11,000,000	Keel in March 1931—Delivery Nov. 1932	30,000
Dollar S. S. Lines	Newport News S. B. & D. D. Co.	8,000,000	Str. Pres. Hoover, Launched Dec. 9, '30 Delivery July, 1931	23,000
Dollar S. S. Lines	Newport News S. B. & D. D. Co.	8,000,000	Delivery Oct. or Nov., 1931	23,000
United Mail S. S. Co. (United Fruit Co.)	Newport News S. B. & D. D. Co.	3,500,000	Keel laid—Delivery Dec., 1931	7,500
United Mail S. S. Co. (United Fruit Co.)	Newport News S. B. & D. D. Co.	3,500,000	Delivery Feb., 1932	7,500
United Mail S. S. Co. (United Fruit Co.)	Newport News S. B. & D. D. Co.	3,500,000	Delivery April 1932	7,500
Oceanic S. S. Co. (Matson Line)	Bethlehem S. B. Corp., Fore River	7,500,000	Str. Monterey, Keel May 17, 1930; delivery Feb., 1932	17,500
Oceanic S. S. Co. (Matson Line)	Bethlehem S. B. Corp., Fore River	7,500,000	Str. Mariposa—Delivery June, 1932	17,500
United Mail S. S. Co. (United Fruit Co.)	Bethlehem S. B. Corp., Fore River	3,500,000	Keel laid	7,500
United Mail S. S. Co. (United Fruit Co.)	Bethlehem S. B. Corp., Fore River	3,500,000	Contract Placed	7,500
United Mail S. S. Co. (United Fruit Co.)	Bethlehem S. B. Corp., Fore River	3,500,000	Contract placed	7,500
Panama Mail S. S. Co.	Federal S. B. Co.	4,250,000	Contract placed	9,500
Panama Mail S. S. Co.	Federal S. B. Co.	4,250,000	Contract placed	9,500
Panama Mail S. S. Co.	Federal S. B. Co.	4,250,000	Contract placed	9,500
Panama Mail S. S. Co.	Federal S. B. Co.	4,250,000	Contract placed	9,500
Grand Total—18 ships		$97,000,000		241,400

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Table II

Merchant Shipbuilding

Assured Future Contracts Based on Mail Awards Made to Date—Jan. 5, 1931

Owner		Lowest Bid	No. of Ships	Gross Tonnage
Export Steamship Corp.	Class 5, 14-knot ships		2	16,000
American-South African Line	Class 5, 13-knot ship		1	8,272
*Grace Steamship Co.	Class 4, 16-knot ship		1	9,500
Atlantic & Caribbean Steam Nav. Co. (Red D Line)	Class 5, 14-knot ship	$1,095,000	1	8,000
Dollar Steamship Lines	Class 3, 18-knot ships		2	23,000
*States Steamship Co.	Class 5, 14-knot ships		2	20,000
*States Steamship Co.	Class 5, 14-knot ship		1	10,000
Colombian Steamship Co.	Class 4, 16-knot ships	$7,500,000	3	15,000
*Grace Steamship Co.	Class 3 ship		1	9,500
United Fruit Co.	Class 4 ships		2	14,000
United States Lines	Class 1, 28-knot ships (32 knots?)		2	100,000
Oceanic & Oriental Nav. Co.	Class 5, 13-knot ships		2	16,000
Oceanic & Oriental Nav. Co.	Class 5, 13-knot ships		2	16,000
Tampa Interocean S. S. Co.	Class 5, 13-knot ships		2	10,000
Eastern S. S. Co.	Class 3, 19-knot ships	Approx. $9,600,000	3	15,000
Total			27	290,272

*Bids called for.

Compiled by Marine Review

Boston, costing a total of $342,500.

In addition to the large volume of new work a considerable amount of reconditioning and elaborate rebuilding is also under way and talked of. An instance of this class of work is the Baltimore Mail Steamship Co.'s five ships which are now being lengthened and outfitted with complete new machinery for a total aggregate sum of about $7,000,000. Other lines are considering similar reconditioning on a more or less elaborate scale.

Though bulk freighter building on the Great Lakes has been at a complete standstill for the past year there are some recent indications of interest in other types of vessels such as self-propelled canalers, carferries and self-unloaders. If past experience can be taken as a guide as far as lakes shipbuilding is concerned, when pessimism is at the peak, renewed activity is generally around the corner. In the meantime every shipyard on the Atlantic coast at least is far busier than at any time since the war.

Once again the United States has embarked on a shipbuilding program destined to place her in the first rank of maritime nations. Who can tell, maybe the period we are now going through will be noted in history as the epoch of the renaissance of American shipping. This is clear. We cannot go back to a condition of helplessness on the seas. We must build up and protect our foreign markets by sending our goods in our own ships.

Condition of Naval Shipbuilding

We now come to naval shipbuilding and future prospects. By act of congress Dec. 18, 1924 eight light cruisers were authorized. All but one of these cruisers, the CHICAGO, now are completed. The probable completion date for the CHICAGO is March 13, 1931. For convenience we have itemized this program in Table V.

By act of congress Feb. 13, 1929, 15 light cruisers were authorized. Of these 15, six have been laid down with the work generally not far advanced, the New York Shipbuilding Co. and the Bethlehem Shipbuilding Corp. being far in the lead with 40.3 and 33.5 per cent of completion respectively; the other four having been awarded to navy yards. Bids from the shipyards for the seventh cruiser in this program are to be opened Feb. 11. Three additional cruisers making a total of 10 out of this program are to be laid down separately; the first not before 1933 nor completed before 1936; the second not before 1934 nor completed before 1937 and the third not before 1935 nor completed before 1938. The remaining five cruisers of the program authorized by congress Feb. 13, 1929 are not to be built. The status of this program is given in Table VI.

This is all in accordance with an agreement entered into at the London naval treaty of 1930. Therefore, all of the 18 eight-inch cruisers we are permitted to build under the London treaty either are built or building or about to be bid on with the exception of the last three Nos. 39, 40 and 41 which as explained above cannot yet be laid down. Cruisers Nos. 42, 43, 44, 45 and 46, though authorized in the act of congress of Feb. 13, 1929, cannot now be built under the London naval treaty.

In addition to the cruiser program contracts have been let for the RANGER, airplane carrier and for submarine V-7. Funds are also available

(*Continued on Page* 56)

Table III

Merchant Shipbuilding

Probable Future Contracts Based on Mail Awards Made to Date—Jan. 5, 1931

Owner		No. of Ships	Gross Tonnage
American West African Line	Class 5, 14-knot ships	3	12,000
New York & Cuba Mail S. S. Co.	Class 5, 15-knot ship	1	6,000
Gulf Mail Steamship Co.	Class 5, 13-knot ship	1	4,000
Lykes Bros. S. S. Co.	Class 5, 13-knot ship	1	4,000
South Atlantic S. S. Co. of Del.	Class 6, 12-knot ships	3	9,000
Tacoma Oriental Nav. Co.	Class 5, 13-knot ships	2	10,000
Mississippi Shipping Co.	Class 5, 13-knot ships	4	20,000
United States Lines	Class 3, 18-knot ships	2	24,000
Roosevelt Steamship Co.	Class 3, 18-knot ships	2	24,000
American West African Line	Class to be prescribed later	2	12,000est.
Total		21	125,000

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Table IV

Merchant Shipbuilding

Some Recent Contracts Placed Independent of Mail Award Requirements

January 5, 1931

Owner	Builder	Cost	Type	No.	Gross Tonnage
Oceanic S. S. Co. (Matson Line)	Bethlehem S. B. Corp.	$7,500,000	Pass. & Cargo	1	18,500
Peninsular & Occidental S. S. Co.	Newport News S. B. & D. D. Co.	.....	Pass. Str.— Florida, keel 9/2/30	1	5,000
Motor Tankship Corp.	Sun S. B. & D. D. Co.	7,900,000	Tankers	5	45,000
Standard Oil Co. of New York	Sun S. B. & D. D. Co.	.....	Tankers	2	13,000
Prof. E. R. Johnson	Bath Iron Works	1,500,000	Yacht Keel 9/18/30	1	1,400
Chas. H. Thorne	Bath Iron Works	.....	Yacht	1	.....
U. S. Coast Guard Service	United Dry Docks Inc.	865,000	Cutter No. 54	1	2,000
City of New York	United Dry Docks Inc.	941,000	Ferryboat	1	.....
Atlantic Refining Co.	Sun S. B. & D. D. Co.	.....	Tanker Del. 1931	1	.....
Gulf Refining Co.	Bethlehem S. B. Corp.	520,000	Tankers (canal)	2	.....
Vesta Coal Co.	Howard Shipyards	.....	Ferryboat	1	.....
City of New York	Todd Shipyards Corp.	582,500	Fireboat	1	.....
Young Bros. Ltd.	Bethlehem S. B. Corp.	134,475	Ocean tug	1	.....
City of Boston	Geo. Lawley & Sons Corp.	342,500	Fireboat	1	.....
U. S. Coast Guard	Bath Iron Works Corp.	1,365,000	Patrol Boats	7	.....

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Table V

Naval Shipbuilding

Details of Light Cruisers Completed or Nearly Completed Act of Congress Dec. 18, 1924

Name	Completed	Displac. Tons	Speed	Battery Main	Battery Anti Air	Where Built
Pensacola	Feb. 6, '30	10,000	32.5	10-8 inch	4-5 inch	New York, Navy Yard
Salt Lake City	Dec. 9, '29	10,000	32.5	10-8 inch	4-5 inch	N. Y. S. B. Co., Camden
Northampton	May 15, '30	10,000	32.7	9-8 inch	4-5 inch	N. Y. S. B. Co., Camden
Chester	June 23, '30	10,000	32.7	9-8 inch	4-5 inch	Beth. S. B. Corp., Quincy
Louisville	Jan. 15, '31*	10,000	32.7	9-8 inch	4-5 inch	Puget Sd., Navy Yard
Chicago	March 13, '31*	10,000	32.7	9-8 inch	4-5 inch	Mare Island, Navy Yard
Houston	June 17, '30	10,000	32.7	9-8 inch	4-5 inch	Newport News S. B. Co.
Augusta	Jan. 31, '31*	10,000	32.7	9-8 inch	4-5 inch	Newport News S. B. Co.

Note: Further particulars for the eight light cruisers listed above are: Length overall 585 feet 6 inches; beam 65 feet 3 inches; depth to main deck at side, 34 feet ¼ inch; draft, 19 feet 6½ inches; type engines, turbine reduction gear, four sets and four propellers; number of boilers, 8; horsepower, over 100,000; 6 torpedo tubes.

*Probable.

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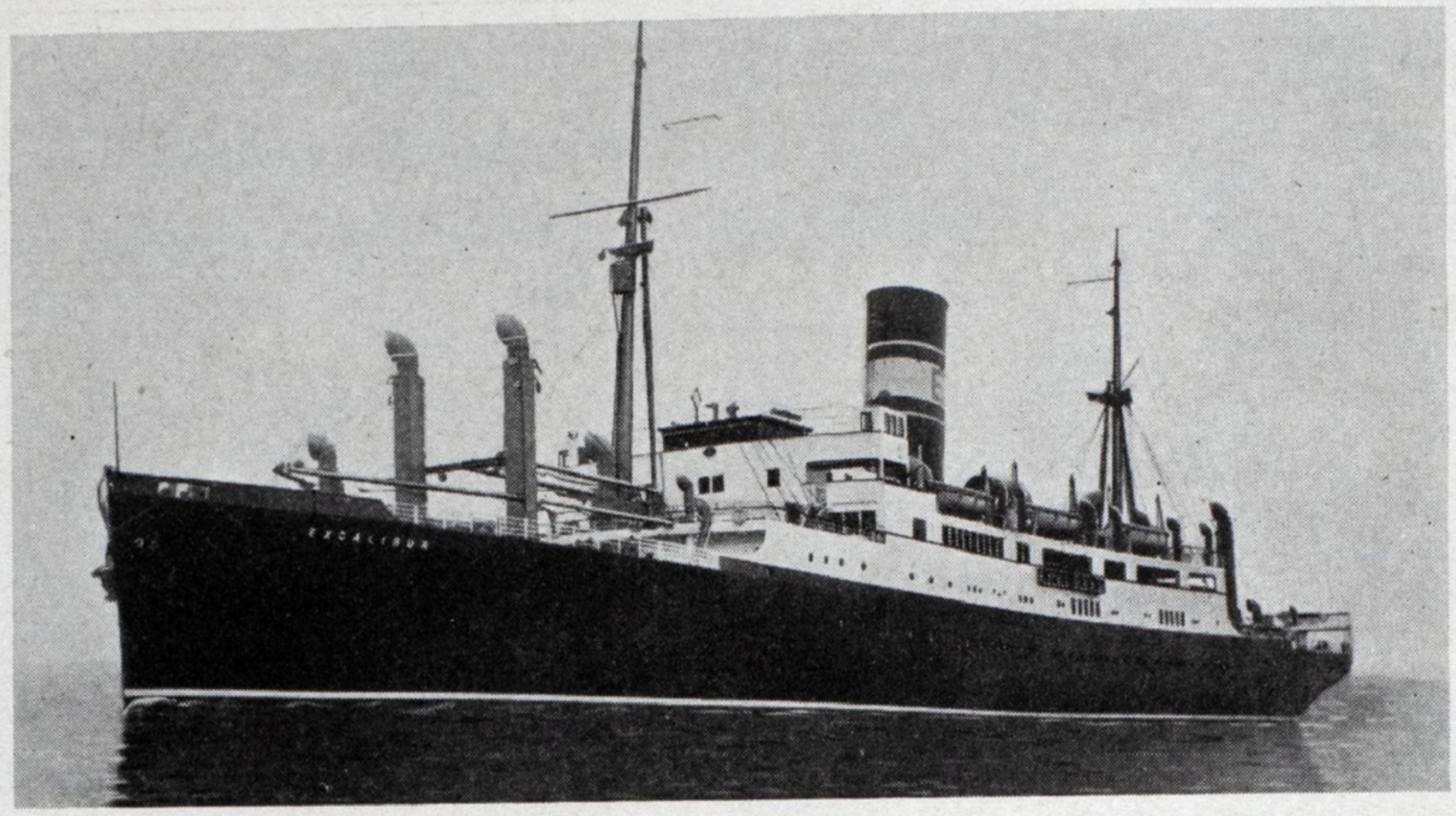
Novel Features Distinguish New Liner

Excalibur—In Service out of New York



King Arthur's gleaming sword, "the blade so bright that men are blinded by it" given him by the lady of the lake, who knew "a subtler magic than his own"—EXCALIBUR! This is the magical name bestowed upon the latest arrival among the ships of the American merchant marine. We greet her. "And slowly answer'd Arthur from the barge: "The old order changeth, yielding place to new.'"

This vessel the first of four sister ships building for the American Export lines, by the New York Shipbuilding Co. to the designs of George G. Sharp, New York naval architect, has now entered service joining a fleet of some 39 vessels plying between the North Atlantic, Mediterranean and Black sea ports, one of the outstanding fleets of the shipping world. She marks an important step in the development of the new American merchant marine. The general characteristics were determined by H. E. Frick, vice president and general manager of the Export Steamship Corp. and the operating staff, based on practical experience covering years of operation in this trade. It is agreeable to note that throughout the construction of the EXCALIBUR and her sister ships a fine spirit of co-operation existed between the shipbuilder, owner and naval architect which is reflected in the excellence of the work.

Order Placed in 1929

The order for the construction of these four intermediate passenger and freight vessels awarded Aug. 31, 1929, constituted one of the largest single contracts for new ships signed in this country since the pre-war slump, and marked the beginning of a new era in American shipbuilding. Granting of a government loan covering three-fourths of the total cost of the ships, is substantial proof of the value of the Jones-White act in providing financial assistance to American shipowners for building new tonnage in American shipyards.

The christening of the EXCALIBUR on Aug. 5, 1930, was of nation-wide interest. It was the launching not only of a ship but of a program signifying America's determination to regain her rightful place on the oceans of the world. Mrs. Herbert Hoover officiated as sponsor and christened the ship. More than a decade had passed since the occasion of the launching of a vessel had been honored by so distinguished a guest. An interesting coincidence was the fact that on the same day, just twelve years before, Mrs. Woodrow Wilson acted as sponsor at the christening of the QUISTCONCK, the first vessel launched at Hog Island.

The Export Steamship Corp. took over the nucleus of the line it is now operating from the shipping board in 1920, a time when it required courage to invest money in American shipping ventures, for, while the matter of government aid had long been talked about, there was then no definite assurance that the needed legislation would ever be enacted. Severe competition faced the new company from the start. Today the company is one of the largest operators of American flag tonnage. Its mail contracts will eventually call for a total of eight new ships of which the EXCALIBUR is the first to enter service.

Single Screw Geared Turbine

The EXCALIBUR is a single screw, geared turbine steamer of flush deck type. Outstanding features are the sharply raked stem and light elliptical stern, the after body of unusual design resulting in a remarkable absence of vibration. The vessel is fitted with a contra rudder. A well balanced profile is lined by two raking masts and a broad oval shaped funnel. All these features combine in giving the vessel a smart and powerful appearance. The hull is built of steel throughout under special survey of the American Bureau of Shipping to the highest rating of this society and is constructed in accordance with the provisions of the International conference on safety of life at sea recently concluded in London. She also conforms to the latest requirements of the United States steamboat inspection service, the public health department of the government and the New York board of fire underwriters. In addition, she has been designed to conform to the navy department's requirements for auxiliary cruisers.

The vessels are designed for a contract speed of 16 knots. On the trial trip of the EXCALIBUR a maximum speed of 18 knots was obtained.

Ten transverse bulkheads provide a high safety factor making her a two-compartment vessel well in excess of the latest International convention requirements for the safety of life at sea. All passenger accommodation bulkheads are of steel or asbestos veneered. The spacing of transverse

The Steamship Excalibur

General Particulars

Owner	Export Steamship Corp.
Builder	New York Shipbuilding Co.
Launched	Aug. 5, 1930
Completed	Dec. 15, 1930
Classification	American Bureau of Shipping
Length overall, feet, inches	475 0
Length between perpendiculars, ft., in	450 0
Beam molded, feet, inches	61 6
Depth molded to shelter dk., feet, inches	42 3
Speed at sea, knots	16
Deadweight, total, tons	9300
Gross tonnage	9350
Net tonnage	5600
Passenger capacity, first class	152
Refrigerated space cubic feet	32,000
Main drive	Single Screw-Turbine Gears
Shaft horsepower at 94 r.p.m	8000
Boilers, watertube, four oil burning Babcock & Wilcox, maximum pressure per square inch	350
Superheat, degrees Fahr	200
Main turbines, triple expansion, Parsons type, built by the New York Shipbuilding Co.	
Reduction gears	single, built by Falk Corp.
Personnel officers and crew	95
Gyro compass and Gyro pilot	Sperry

fireproof bulkheads throughout the passenger accommodation does not exceed 45 feet, adding greatly to the fireproofing features of the ship.

The EXCALIBUR, and her sister ships EXOCHORDA, EXETER and EXCAMBION, are designed for passenger, freight and mail service between New York and Mediterranean ports. Each vessel has accommodations for 152 first class passengers, and each will have a deadweight carrying capacity of 9300 tons. Refrigerated space for 32,000 cubic feet of perishable freight is also provided.

Staterooms on Shelter Deck

Most of the passenger staterooms are located on the shelter deck, together with the foyer, purser's office, doctor's office and barber shop. Directly below on B deck are found additional passenger quarters, the main dining saloon, galley and pantry. In a large steel deck house on the promenade deck are the library, smoking room, several stateroom suites, and a children's playroom. There are 54 staterooms in all, equipped with bath or shower and toilet. Each room is completely furnished for comfort and convenience with metal beds, built-in settees, combined dressing table and wardrobes, easy chairs and tables.

All the staterooms have interlined selbalith floors with rugs. All floors in public rooms, corridors and verandas are selbalith with Goodyear rubber tiling. The smoking room has an inlaid selbalith floor, and the crew's quarters have selbalith floors.

The design of the public rooms is expressed in simple architectural terms in contrast to the over decorated treatments frequently used. The library, located at the forward end of the promenade deck, is a spacious attractively decorated room with domed ceiling. Lupton casement windows are fitted on three sides, which afford a maximum of light and air. A central corridor leads to the smoking room located at the after end of the promenade deck. This room is paneled, framed and furnished in old chestnut and is equipped with complete service pantry. In keeping with the library, this room also has a domed ceiling and Kearfott Kawneer casement windows, giving this space excellent light and ventilation.

The main promenade deck, 12 feet wide and completely unobstructed, runs around the deck houses on A deck. This deck will be a popular rendezvous for passengers regardless of season. The forward end of the deck is enclosed with Kearfott balanced plate-glass windows forming a veranda cafe. Above this deck is a boat deck offering another spacious and unobstructed open air promenade. An interesting feature in the vessel is the semi-indirect lighting of the staterooms, dining room and foyer. The fixtures are in Lenox china producing a soft lighting effect, the design of which together with the general architectural treatments were carried out under the direction of Robert Maust and Charles J. Hoffmann of Ludlow Peabody, New York.

Veranda System of Staterooms

Other features include an up-to-date postoffice for assorting the mail en route; a passenger hospital with two wards each with a bath room, a dispensary and operating room all furnished with the most modern equipment; a crew's hospital similarly equipped to accommodate six persons, and a modern laundry electrically equipped for the convenience of passengers.

The layout of the entire passenger accommodation system marks an advanced step in the design of passenger ships. The old scheme of a row of outside staterooms along the ship's sides followed by several rows of inside rooms artificially lighted and

Single Screw Steamship Excalibur---Auxiliary Machinery and Equipment Particulars

Boilers and Auxiliaries

Four Babcock & Wilcox watertube boilers arranged in one fire room. Steam supplied at 350 pounds working pressure and 200 degrees Fahr. superheat. Total heating surface, 16,800 square feet. Total superheating surface, 1600 square feet.
Oil Fired—Each boiler fitted with 4 Cuyama oil boilers.
Induced Draft—Four Sturtevant blowers driven by 20 H. P. Westinghouse motors.
Soot Blowers—Diamond Power Specialty
Condenser—To maintain 28½ inches vacuum with sea water at 75 degrees Fahr. Two 2-stage condensate pumps—two sets of Westinghouse 2-stage air ejectors.
Auxiliary Condenser—Worthington 2-pass, 1500 square feet cooling surface.
Oil Purifier—One Sharples No. 6—super centrifuge with capacity of 350 gallons per hour of lubricating oil.

Engine Room Auxiliaries

Auxiliary Turbo Generators—Three General Electric 150 Kilowatts 240/120 volts. Three wire direct current steam end 350 pounds pressure 200 degrees superheat.
Auxiliary Generators Emergency—Two 10-K. W. automatic gasoline engine driven Weir Kilby with Waukesha engine and Westinghouse generators.

Pumps and Services

One Main Feed, 2½ inch, 4-stage turbine driven.
One Main Condenser Circulating Pump, 30-inch, 1-stage, motor driven.
Two Main Condensate Pumps, 3½-inch, 2-stage, motor driven.
One Fire Pump, 3-inch, 2-stage, motor driven.
One Sanitary Pump, 3-inch, 2-stage, motor driven.
One Auxiliary Condenser Circulating Pump—8-inch, 1-stage, motor driven.
One Lubricating Oil Cooler Circulating Pump—5-inch, 1-stage, motor driven.
One Refrigerator Condenser Circulating Pump—2-inch, 1-stage, motor driven.
Two Brine Pumps—1½-inch, 1-stage, motor driven.
One Emergency, Vertical, Motor Driven Bilge Pump—4-inch, 1-stage.
One Auxiliary Feed Pump, Vertical Single, 16 x 12 x 24 inches.
One Ballast Pump, Vertical Single, 10 x 14 x 24 inches.
One Fuel Oil Fire Pump, Vertical Single, 10 x 14 x 24 inches.
One Bilge Pump, Vertical Single, 10 x 14 x 24 inches.
One Fresh Water Sanitary Pump, Vertical Single, 7 x 8 x 12 inches.
One Fresh Water Drinking Pump, Vertical Single, 4½ x 5 x 12 inches.
One Hot Fresh Water Pump, Vertical Single, 4½ x 5 x 12 inches.
One Hot Salt Water Pump, Vertical Single, 4½ x 5 x 12 inches.
One Evaporator Feed Pump, Vertical Single, 4½ x 5 x 12 inches.
One Distiller Circulating Pump, Vertical, Single 3½ x 4 x 9 inches
Two Lubricating Oil Pumps, Vertical Single, 10 x 12 x 24 inches.
One Fuel Oil Service, Vertical Single, 5¾ x 4 x 8 inches.
One Auxiliary Condenser Air Pump, Vertical Single, 7½ x 14 x 12 inches.
All of the foregoing pumps furnished by the Warren Steam Pump Co.
One Quimby Vertical Motor Driven Fuel Oil Service Pump.

Ventilation and Refrigeration

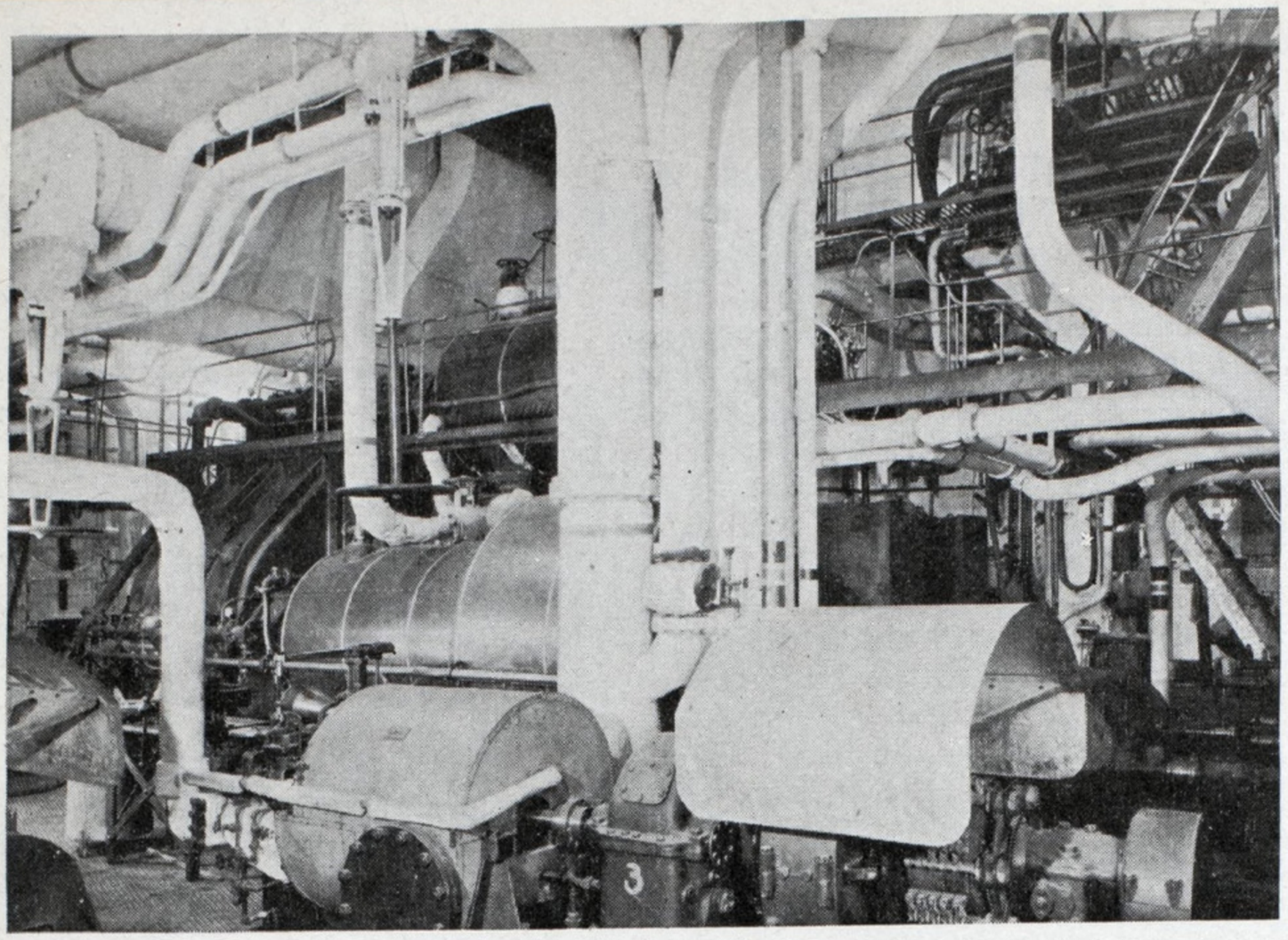
Four Buffalo Forge Supply Fans.
Five Buffalo Forge Co. Exhaust Fans.
Refrigeration—Three Brunswick-Kroeschell CO_2 steam engine driven compressors of 7 tons capacity each.
Two coil condensers each capable of serving two compressors.
Two trunk and coil evaporators with capacity equivalent to that of two compressors.
Three 40-gallon and one 25-gallon scuttle butts. The condenser coil evaporators and scuttle butts were also supplied by Brunswick-Kroeschell.
Shaft Turning Gear—Made by New York Shipbuilding Co.; motor driven 10 Horsepower.
Electric Motors—All of Westinghouse drip proof type.

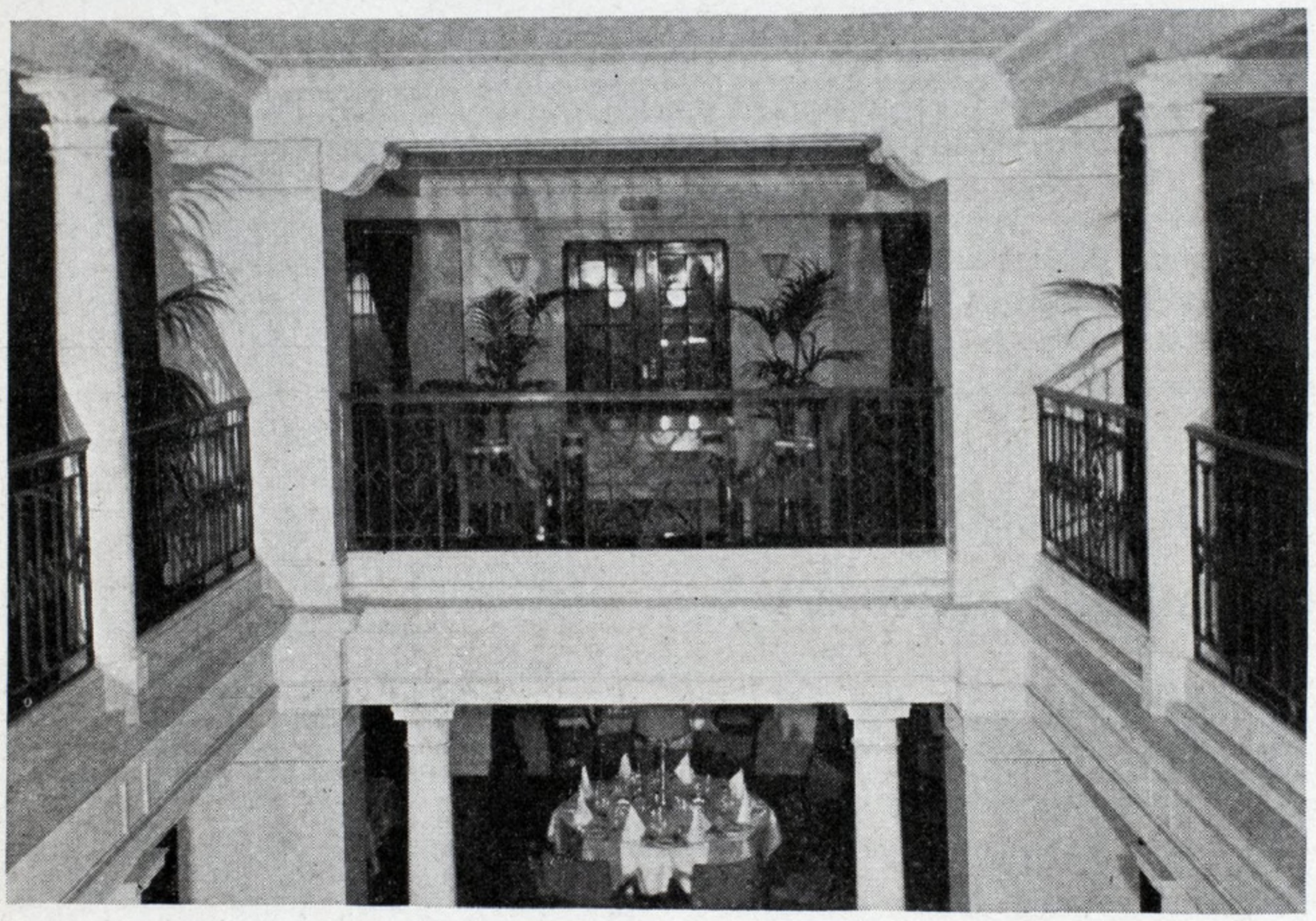
Machine Shop Equipment

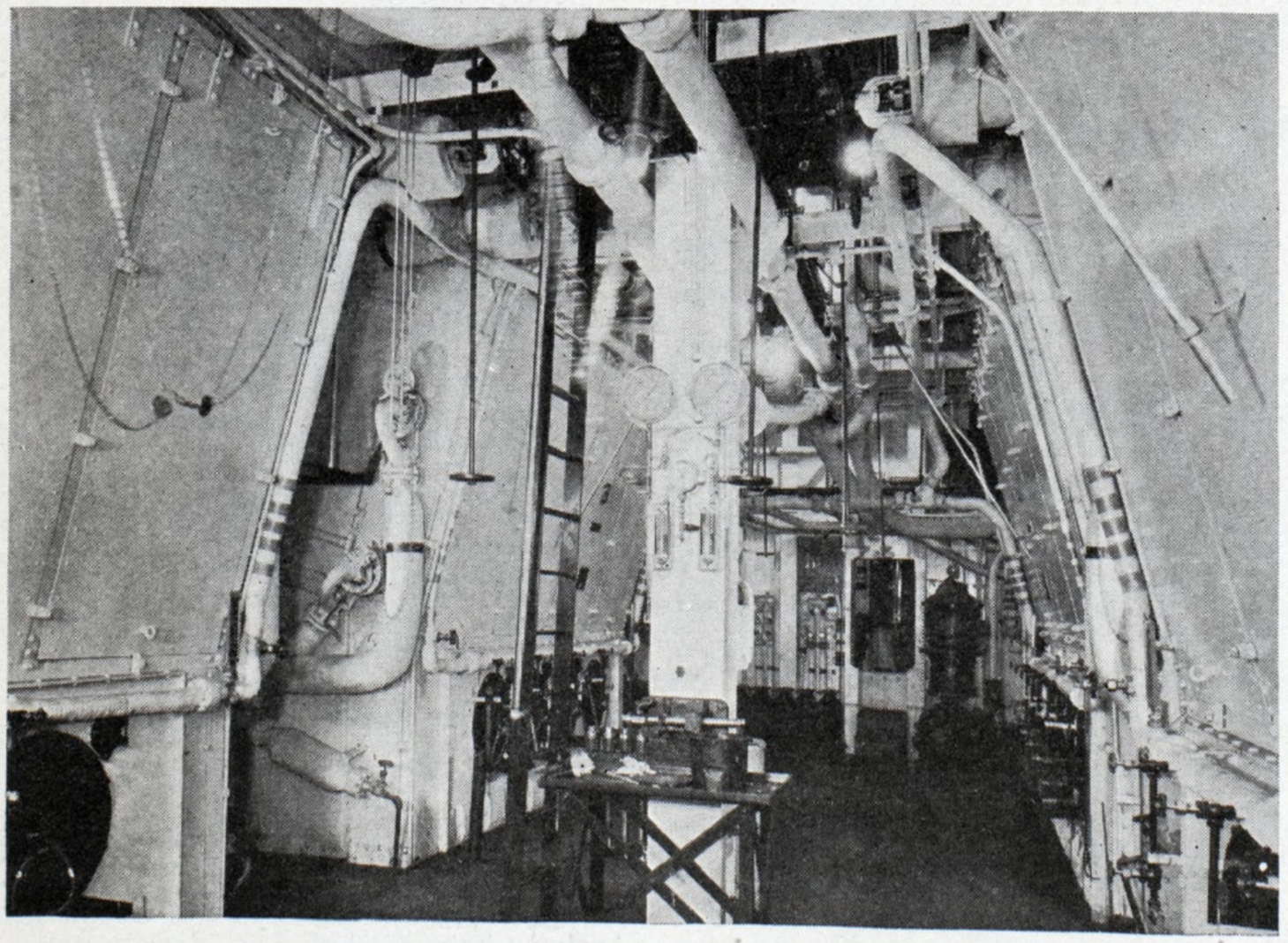
Fully equipped with one 5 H. P. motor driven milling machine; One 24-inch x 12-foot lathe motor drive 7½ H. P.; One 36-inch radial drill 5 H. P. motor driven; One 24-inch shaper 5 H. P. motor driven; One 20-inch wet tool grinder 2 H. P. motor driven; One dry grinder 2 H. P. motor driven.

Miscellaneous Equipment

Cargo elevators—A. B. See electric—with lifting capacity of 4000 pounds.
Traveling Crane—One Chisholm Moore, 25-ton, for use in engine room.
Separator—One Welch 100-ton capacity for bilge water.
Feed Water Heaters—One first stage—one second stage, Davis Engineering Corp.
Evaporators—Two, capacity each 30 tons fresh water in 24 hours, Davis Engineering Corp.
Distiller—One capacity 2000 gallons fresh water in 24 hours vertical type, Davis Engineering Corp.
Lubricating Oil Coolers—Two horizontal type, Davis Engineering Corp.
Heaters—Fuel Oil—Two vertical type, Davis Engineering Corp.
Tank Heaters—Two, one for hot fresh water and one for salt water, furnished by Heat Transfer Products Co.
Anchor Chain—Furnished by National Malleable & Steel Castings Co.







Views of the S. S. Excalibur. Upper—Engine Room, Auxiliary Generators, Reduction Gears. Middle—Lobby on Shelter Deck Looking Into the Dining Room. Lower—Boiler Room, Four Babcock & Wilcox Watertube Boilers

ventilated or, in some cases, with narrow bibby passages leading to a port hole at the vessel's side, has been discarded. A veranda system making every stateroom virtually an outside room has been developed by the naval architect, Mr. Sharp. In this system perfect ventilation is achieved. natural air and light being carried to every stateroom in the ship and even the innermost staterooms command an excellent view of the sea. The spaciousness and home like atmosphere in these new passenger quarters is the most striking feature to the visitor on board.

At first sight it appears that the veranda system involves a loss in the number of staterooms that can be installed in a given vessel using the old arrangement of inside and outside staterooms. However, the veranda system when applied to a number of post war passenger vessels demonstrates that in most cases there is an actual gain in the number of rooms that can be installed in any particular vessel. The wide central corridor throughout the accommodation with side corridors opening into spacious verandas at the vessel's sides permits a perfect symmetrical layout for the passenger quarters. Staterooms are neatly arranged in bays around a concentrated system of private and public bathrooms and sanitary quarters, thereby grouping all piping and overboard discharges.

Roominess in Minimum Space

All the staterooms are of rectangular shape, furnished with beds and night tables, a sofa and a unit of modern design combining two large wardrobes and dressing table with mirror and drawers. The effect of their arrangement is extraordinary roominess for a minimum of space occupied. The comfort of the passenger is further enhanced by the fact that through two large Lupton casement windows, opening onto the private veranda at the ship's side, an abundance of light and air stream into the room, creating the healthful and home like atmosphere to which Americans are accustomed in their homes.

The main galley and pantries are located just aft of the dining saloon and are entirely enclosed by steel bulkheads. The hot and cold pantries, butcher shop, bakery, etc., are enclosed by wire mesh and the entire galley is fitted with mechanical ventilation both supply and exhaust. The layout is arranged for one way service.

The principal electrical units of equipment for the galley consist of Edison Electric Appliance Co. heavy duty ranges, cooking tops, broiler roasting oven, baking oven, broiler griddles, waffle bakers, hot plates, slice toasters, etc. All of this above equipment is operated on a 240-volt circuit.

Galley equipment such as steam tables, steam cookers and ovens, meat

choppers, etc., were furnished by Bramhall Deane. The electric dish-washing machine was furnished by Bleaksley & Co.

The vessel has seven holds all of which are served by hatches through the weather deck, with the exception of No. 4 hold carrying refrigerated cargo, the ship's stores, strong room, etc., which is served through side ports and elevators. Holds Nos. 3 and 5 below the lower deck are used for deep ballast tanks.

There are eight hatches in all, served by sixteen 5-ton derricks and operated by sixteen Hyde Windlass Co. winches. There is also a 30-ton derrick for No. 6 hold.

The latest gyro-compass and gyro-pilot equipment supplied by the Sperry Gyroscope Co. has been installed, which includes a master gyro compass, motor generator, repeater compass, course recorder, rudder-angle indicator, etc.

The steering gear, supplied by the Hyde Windlass Co. is of the Brown steam tiller type with 9-inch by 12-inch double steam cylinders controlled from the wheel house by a Brown hydraulic telemotor.

Marine navigation equipment was also supplied by the Kelvin & Wilfrid O. White Co. A three-bell chime whistle was supplied by the Star Brass Co. The Mackay Radio & Telegraph Co. supplied a 500-watt combination type radio telegraph transmitter and the Radio Corp. supplied the radio direction finder.

The vessel has four 28-foot and one 26-foot metal life boats, also one 26-foot motor launch.

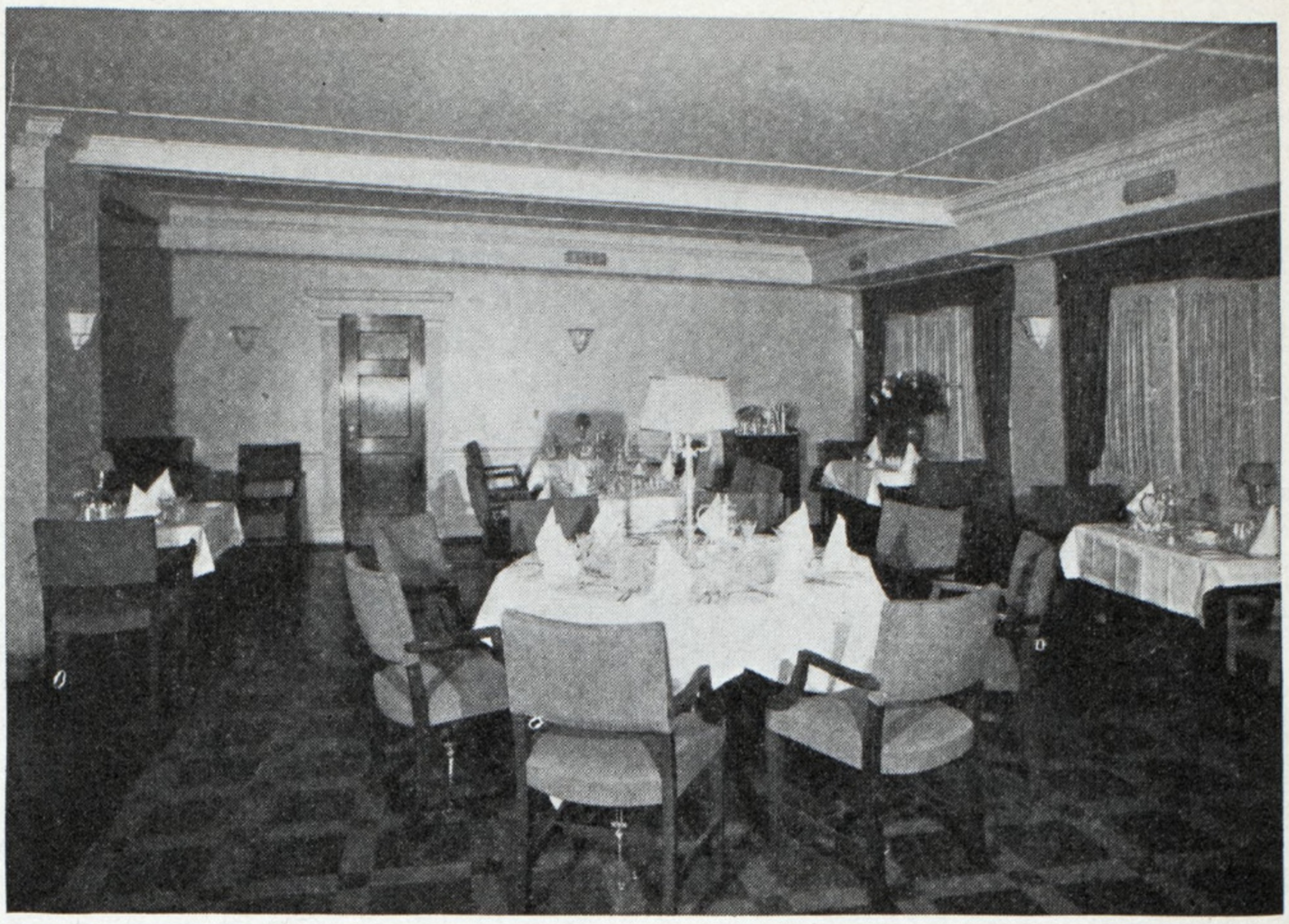
On the forward deck is a Hyde Windlass Co. horizontal, spur geared steam windlass, with two wildcats and two warping heads, driven by a 14-inch by 12-inch double cylinder vertical inverted engine.

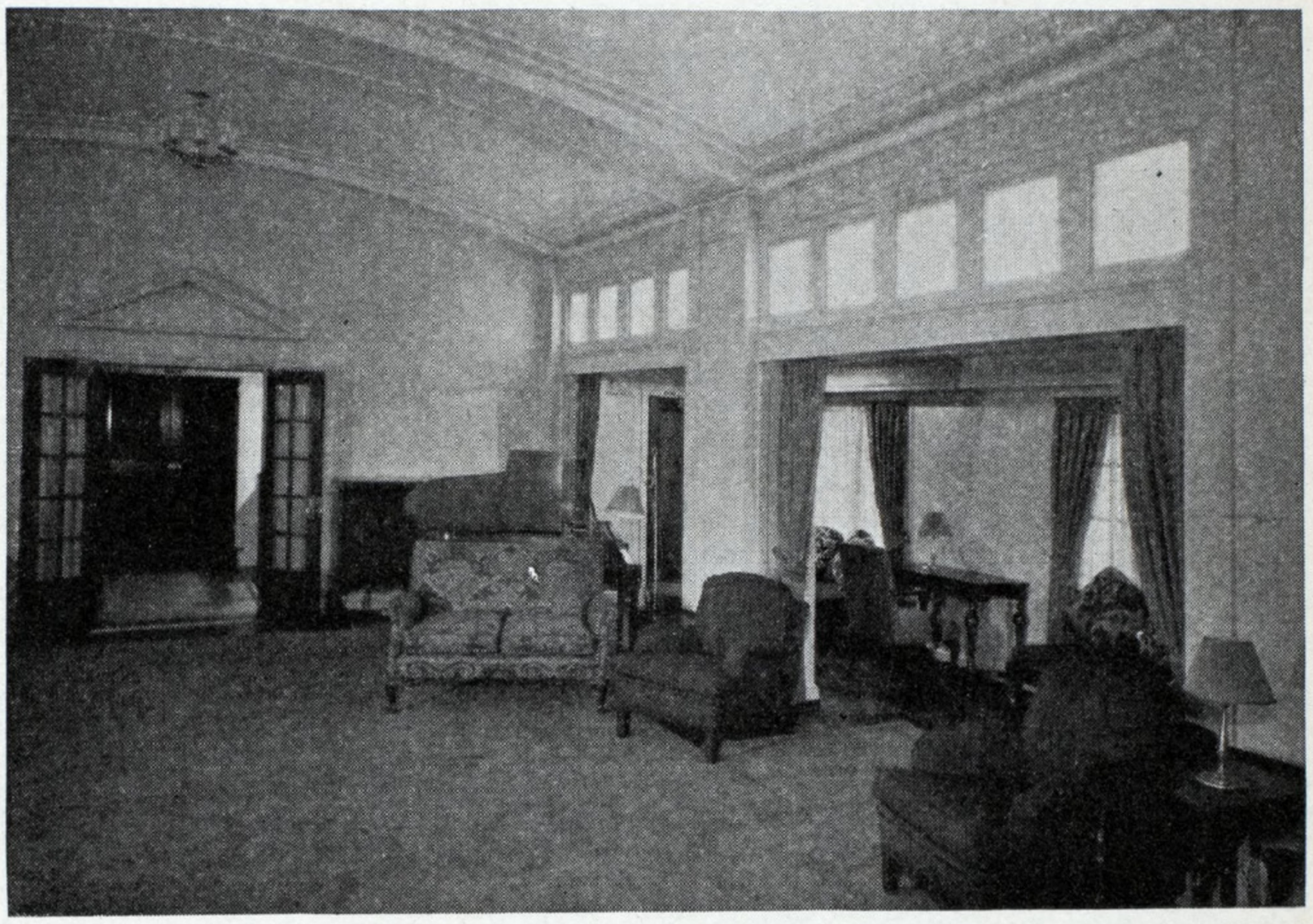
Elaborate Fire Protection

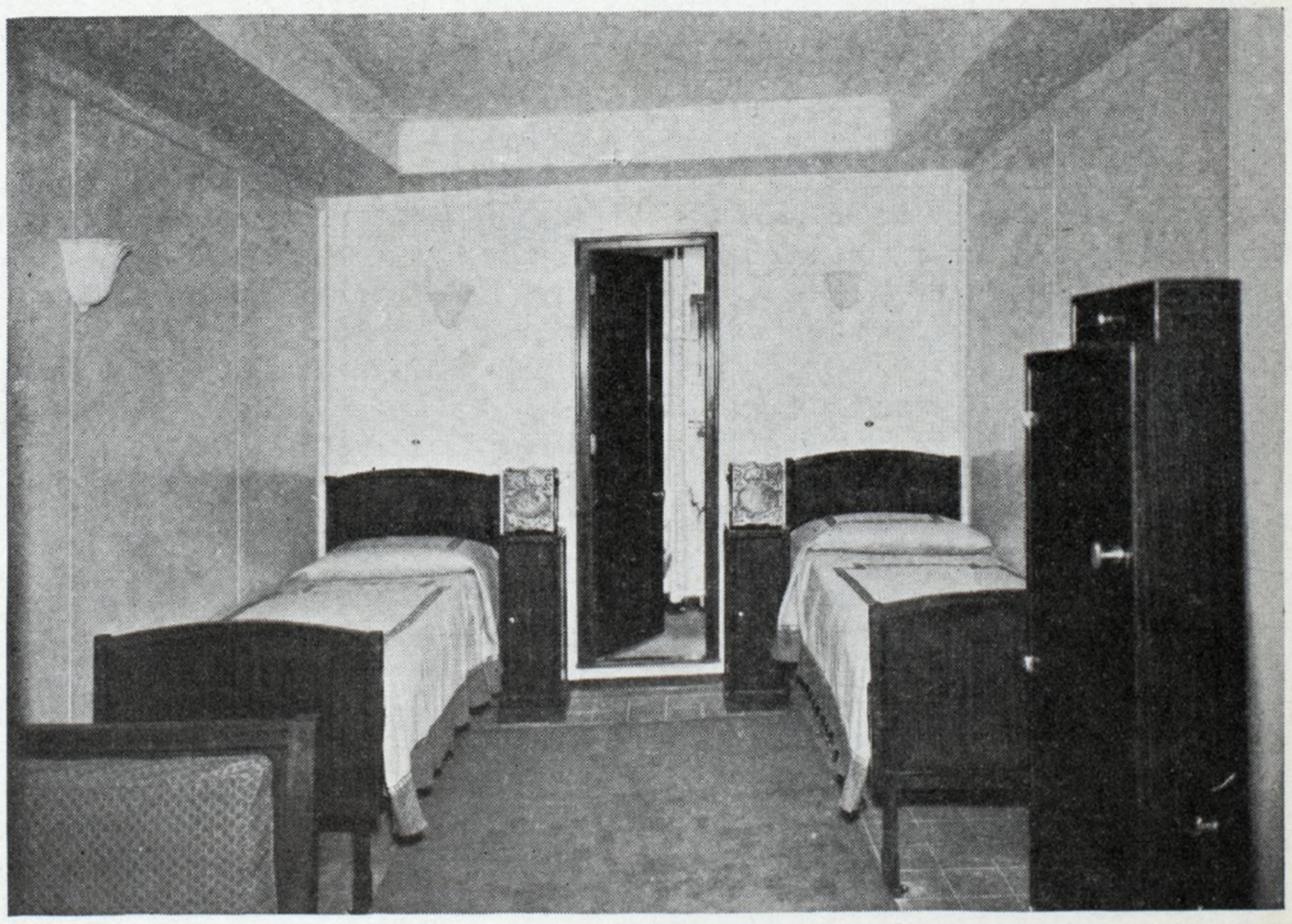
Every possible contingency has been provided for in fire detecting and extinguishing apparatus. A Derby system of fire detection has been installed in the passenger public spaces, officers' and crew's quarters, storerooms, etc., which is operated by the action of excessive temperature upon thermostats, warning of fire being indicated in the wheelhouse.

Below deck the Lux-Rich system is installed, which comprises smoke-detecting lines from the various cargo spaces to a cabinet in the wheelhouse, in which indication is given of the first trace of smoke from a smouldering cargo fire.

For extinguishing purposes Lux cylinders are installed in conjunction with the Rich system. These cylinders provide enough Lux gas to maintain a fire smothering concentration in any cargo space. A separate Lux system is installed to protect under-floor areas in the boiler room, and automatic Lux-Rich cutouts for induced







Views of the S. S. Excalibur. Upper—Corner of the Dining Saloon. Middle—Home-like Lounge a Distinctive Feature. Lower—Roomy Two-Berth Cabin With Private Bath

draft blowers and fuel pumps are also provided in case of fire.

There are three cargo refrigerator boxes, having a total of about 32,000 cubic feet capacity for carrying meat or for fruit and vegetables, and ships' store boxes having a total of about 5518 cubic feet. The refrigerating machinery consists of three Brunswick Kroeschell Co. CO_2 compressors, each driven by an 8-inch by 8-inch vertical steam engine, 3-inch diameter by 5¾-inch stroke, operating between speeds of 175 to 215 revolutions per minute. There are two condensers, two evaporators, two brine circulating pumps and one condensing water pump.

The passenger accommodations, public rooms and crew's spaces amidships have a combined system of heating and ventilation using the ventilation supply duct as a means of heating by introducing steam Aerofin heater units near the supply fans. An exhaust system is also installed throughout the quarters where required. The entire system operates smoothly and quietly. The officers' and crew's quarters are steam heated.

Fresh hot and cold water is piped to wash basins and baths in all staterooms. Hot and cold salt water is piped to the baths and showers. All plumbing fixtures were supplied by the J. L. Mott Co.

The Radio Corp. Victor Co. supplied a combination radio broadcast receiver and phonograph for use in the entertainment features of the ship. With this system loud speakers are located in the foyer well with an auxiliary attachment in the library and deck veranda.

The main propulsion machinery, built by the New York Shipbuilding Co., consists of Parsons type, triple expansion turbines with Falk single reduction gearing arranged for driving a single screw. There is one high pressure, one intermediate pressure and one low pressure turbine, rated to deliver 7200 normal shaft horsepower at 94 revolutions of the propeller shaft and 8000 shaft horsepower at 97 revolutions per minute of the propeller shaft. The high pressure astern turbine is in the same casing with the intermediate pressure turbine and the low pressure astern turbine is in the casing with the low pressure ahead turbine.

The astern turbines are rated to deliver 4320 shaft horsepower. A bleeder connectoin is taken from the high pressure exhaust belt for second-stage feedwater heating and from the third stage or intermediate pressure turbine for first stage, feedwater heating.

Steam is supplied at 350 pounds per square inch working pressure and 200 degrees Fahr. superheat by four Babcock & Wilcox watertube boilers arranged in one fireroom. Two boilers on the port side and two on the starboard side are arranged fore and aft facing inboard with the firing space between them. Each boiler has 4200 square feet of heating surface and 400 square feet of superheating surface or a total of 16,800 square feet of heating surface and 1600 square feet of superheating surface.

Babcock & Wilcox desuperheaters of the internal drum type are fitted principally for port use reducing the superheat to 20 degrees Fahr. at 350 pounds gage pressure.

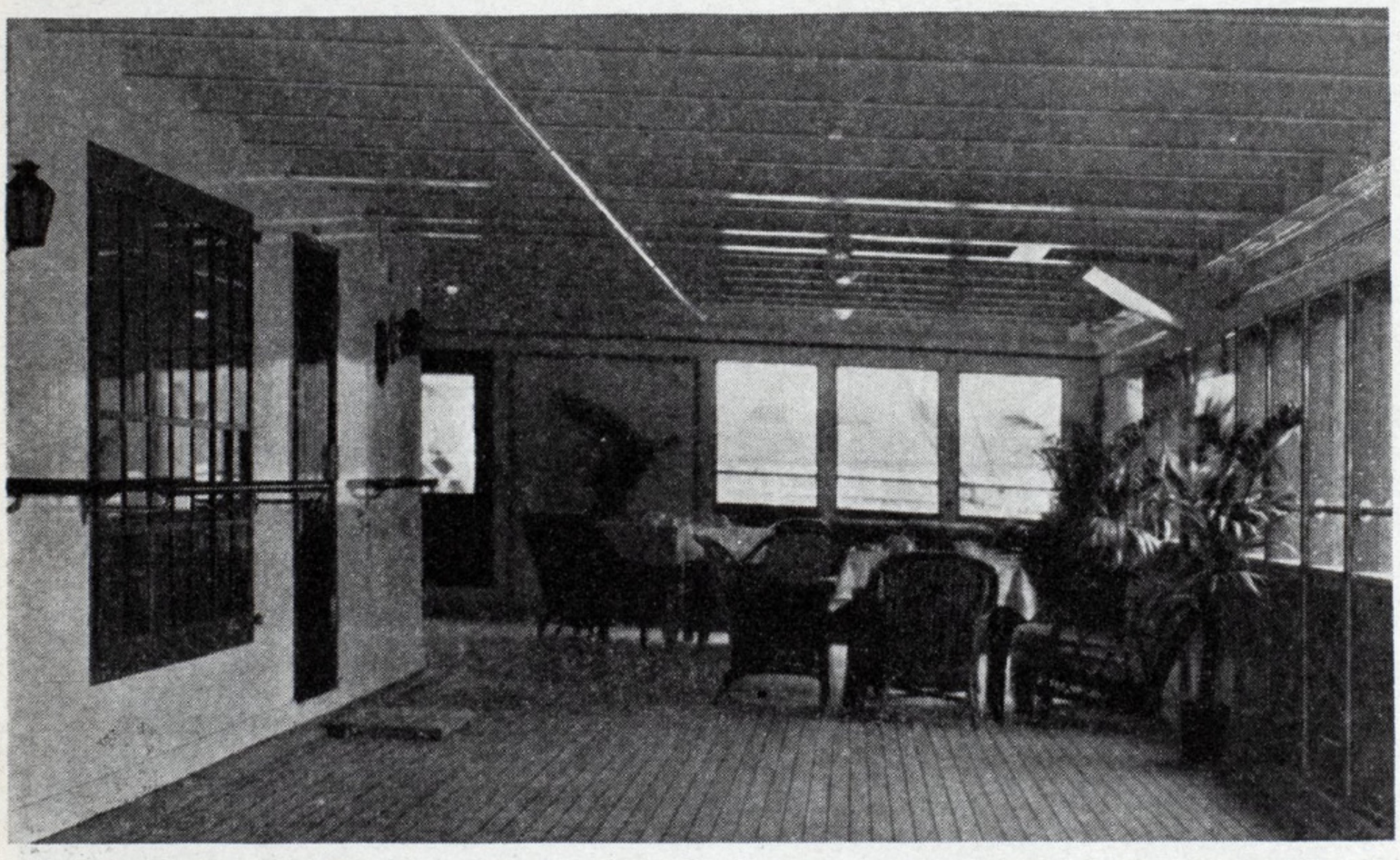
The boilers are fitted for burning fuel oil under induced draft. Each boiler is fitted with four oil burners of the Cuyama type. Four induced draft blowers, one for each boiler, are located at the third deck level. A damper is installed in the uptake so that the blower may be shut off and the boiler run on natural draft.

The main condenser is designed to maintain a vacuum of 28½ inches with sea water of 75 degrees Fahr. at normal power. Two two-stage condensate pumps are installed, each of which is of sufficient capacity to handle the condensate from condenser, the other serving as a standby unit. Two sets of Westinghouse twin two-stage air ejectors with inter and after condensers are installed in connection with the main condenser.

The auxiliary condenser furnished by the Worthington Pump & Machinery Corp. is a two-pass condenser with 1500 square feet of cooling surface.

A Hickman air separator is installed in the main feed line.

One Sharples No. 6 super-centrifuge, having a capacity of 350 gallons per hour of lubricating oil, is installed. Generating pumps and other auxiliary equipment is listed for convenience in the table on page 23, with sizes and manufacturers noted.



Veranda Cafe, Forward End of Enclosed Promenade Deck on S. S. Excalibur

I. M. M. Co. Has Record Year in Tourist Trade

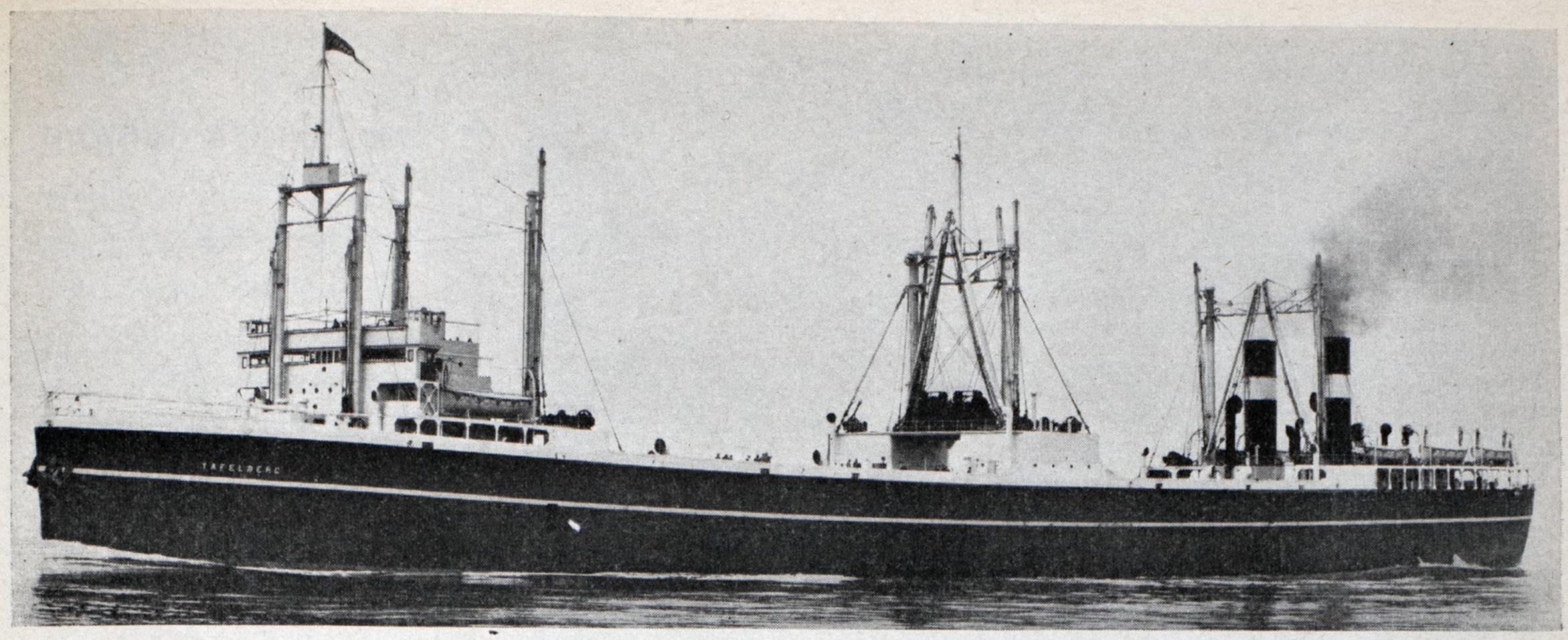
For the sixth successive year the associated lines of the International Mercantile Marine Co., carried more tourist third cabin passengers across the Atlantic than any other line or group of lines. Figures for 1930 made public on Jan. 13 by J. S. Mahool, passenger traffic manager of the company, show that 60,522 passengers traveled in this class on ships of the White Star, Red Star and Atlantic Transport lines, owned or operated by the International Mercantile Marine Co. This represents an increase of more than 5,000 over the record number carried by the company in 1929.

Has Good Year in 1930

The annual report of the United Fruit Co. and its subsidiaries for the calendar year 1930 shows net income of $12,411,507, or the equivalent of $4.24 a share after providing for interest, insurance, taxes and depreciation. Of this amount $11,699,496 was declared in dividends and the balance, $711,561, was added to surplus account. The balance of cash on hand, including government securities, as of Dec. 31, 1930, was $22,801,387, as compared with $24,322,729 on hand at the close of the previous year.

Grace Declares Dividend

At a meeting of the directors of W. R. Grace & Co., it was voted that in addition to the regular semiannual dividend of $3 per share on the first preferred stock, payable December 31 to stockholders of record on Dec. 30, and then regular semiannual dividend of $4 on the Class A and B preferred stock, payable Dec. 29 to stockholders of record on Dec. 27, the regular quarterly dividend of $1 be declared and an additional extra dividend of $1 on the common stock, payable Dec. 29 to stockholders of record on Dec. 27. A similar extra dividend on the company's common stock was voted by W. R. Grace & Co. a year ago.



Whaling Factory-Twin Screw Steamer Tafelberg built by Sir W. G. Armstrong, Whitworth & Co., Newcastle-on-Tyne

Modern Whaling Requires Elaborate and Costly Special Vessels

THE twin screw whaling factory steamer TAFELBERG built for the Kerguelen Sealing and Whaling Co. Ltd. of Capetown, South Africa, by Sir W. G. Armstrong Whitworth & Co. (Shipbuilders) Ltd., was launched from the Walker shipyard Newcastle-on-Tyne, April 29, 1930, and had a sea trial on July 14, 1930.

The principal dimensions of the vessel are: Length overall, 520 feet; length between perpendiculars, 505 feet; breadth molded, 72 feet; depth to upper deck, 51 feet 6 inches. She is designed to carry 15,500 tons deadweight on a mean draft of 30 feet at a speed of 11 knots.

The TAFELBERG has been specially designed, constructed and equipped as a floating factory for extracting oil from the carcases of whales, or alternatively, for carrying oil in bulk. She acts as a mother ship to a fleet of whale catchers. On board the vessel there is a large and expert staff to deal with the catch by putting the whales through the necessary process for extracting the oil which is stored in tanks on board the factory.

Two Decks With Freeboard

She is of the two deck type with freeboard, raked stem and cruiser stern, built under special survey of Lloyd's classification society to the class + 100 A.1. The framing is longitudinal and specially strengthened for working in ice. The vessel complies with the factory act and British board of trade requirements.

Comfortable accommodation is provided for the captain, manager, doctor, secretary, inspector, foreman and deck officers and gunners, on the upper deck, bridge and flying bridge decks.

The engineers, whale catcher engineers and officers, and petty officers are accommodated on the aft cabin flat; and the seamen and firemen, and the mess rooms are on the second deck aft. The whaling crew's accommodation is at the fore end of the vessel.

The main galley and bakery are fitted at the aft end of the vessel complete with range, cooking pots, ovens, etc. A galley for whaling crew is fitted forward.

Quarters throughout the vessel are steam heated by means of radiators and pipes suitable for working in Antarctic regions. Ventilation is provided by means of cowls and trunking to living quarters, factory, cargo spaces, store rooms, and engine and boiler rooms.

Oil Fuel in Double Bottoms

There are two longitudinal bulkheads and nine main oil compartments formed by intermediate oiltight transverse bulkheads making 27 tanks in all and a 4 x 4 feet oiltight hatch is fitted to each compartment. Heating coils are fitted to all main oil cargo compartments and bunkers. Summer tanks are fitted at the top of the wing tanks.

The cargo oil pump room is situated between Nos. 4 and 5 oil compartments. An oil fuel pump room forming a cofferdam extends from side to side of the vessel at the after end of the oil compartments, and a cofferdam is fitted at the forward end.

Oil fuel is carried in the cross bunker and double bottom under boilers; and a cofferdam is fitted between the

(*Continued on Page* 62)

By Using Efficient Tools

IN nothing perhaps is the mechanized world of today more vividly differentiated from the old days than in the modern manner and tools used in whaling. This comparatively recently revived industry has demonstrated high initiative and courage in the design of elaborate and ingeniously fitted out large, costly vessels to serve not only as mother ships to the small whalers but actually as floating factories, so that all varieties of the product can be brought home to market in finished condition. And the means for doing all this are as advanced today over the old days of the sailing ship whaler as is the ship itself. Whaling is evidently a business giving high returns. In its operation it appeals to the adventurous spirit and it requires men as well as ships for success.

A New Marine Railway

1. Gantry whirler crane. Capacity 30 tons at 30 feet.

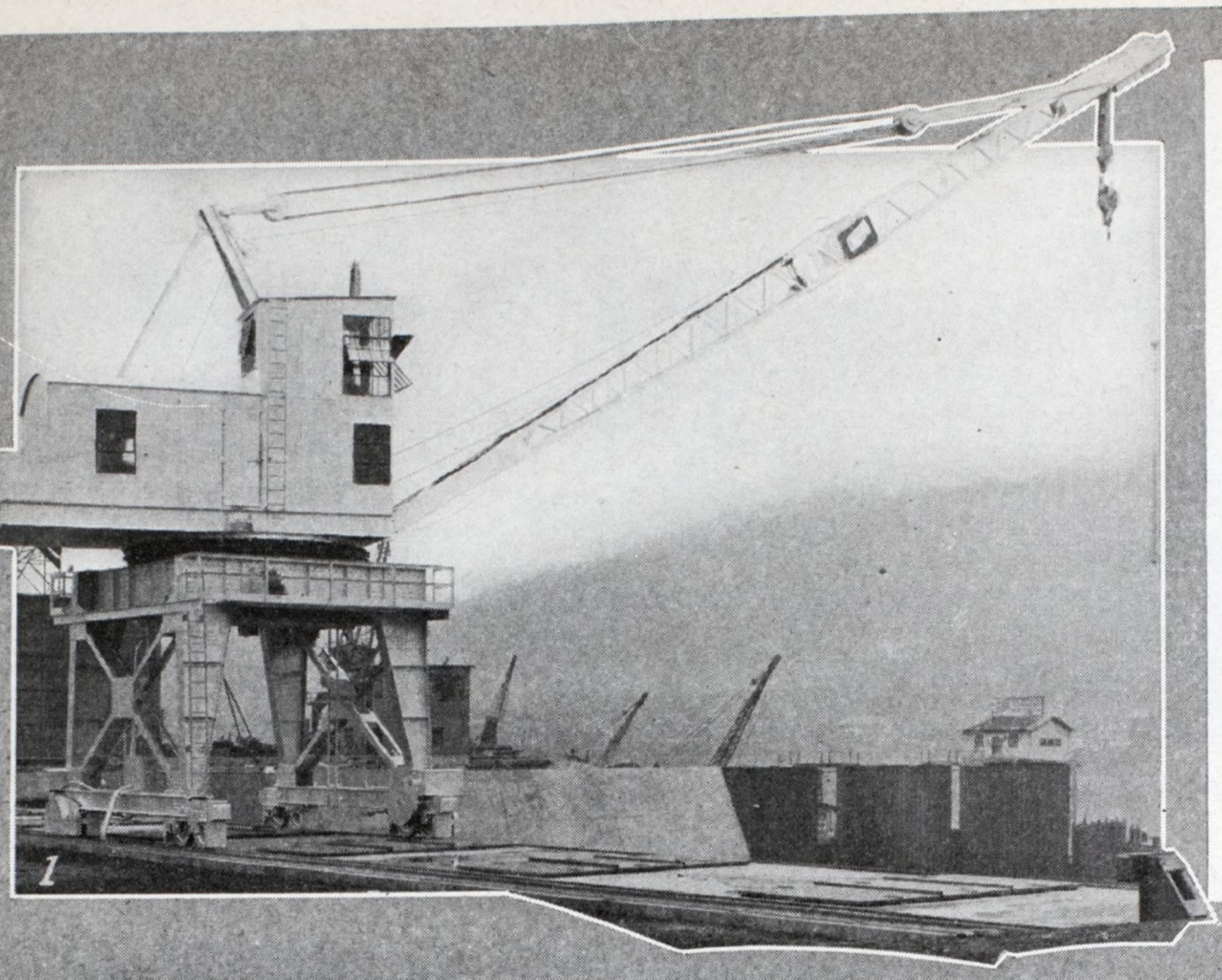
2. One of the 12 carriages.

3. Modern sidehaul marine railway. Capacity 3600 tons.

4. Steel barge on the new marine railway.

5. Each carriage has a capacity of 300 tons.

6. Outfitting dock of the Dravo Contracting Co.'s shipyard, Neville Island.



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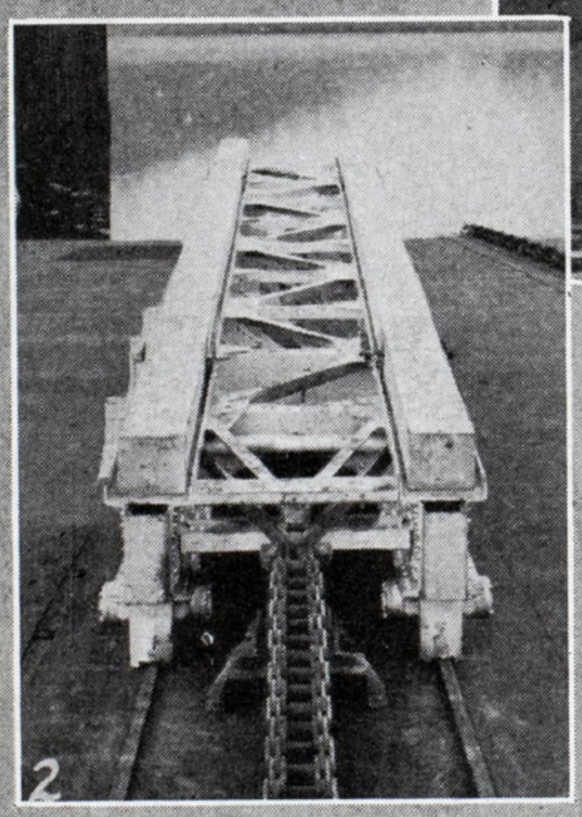

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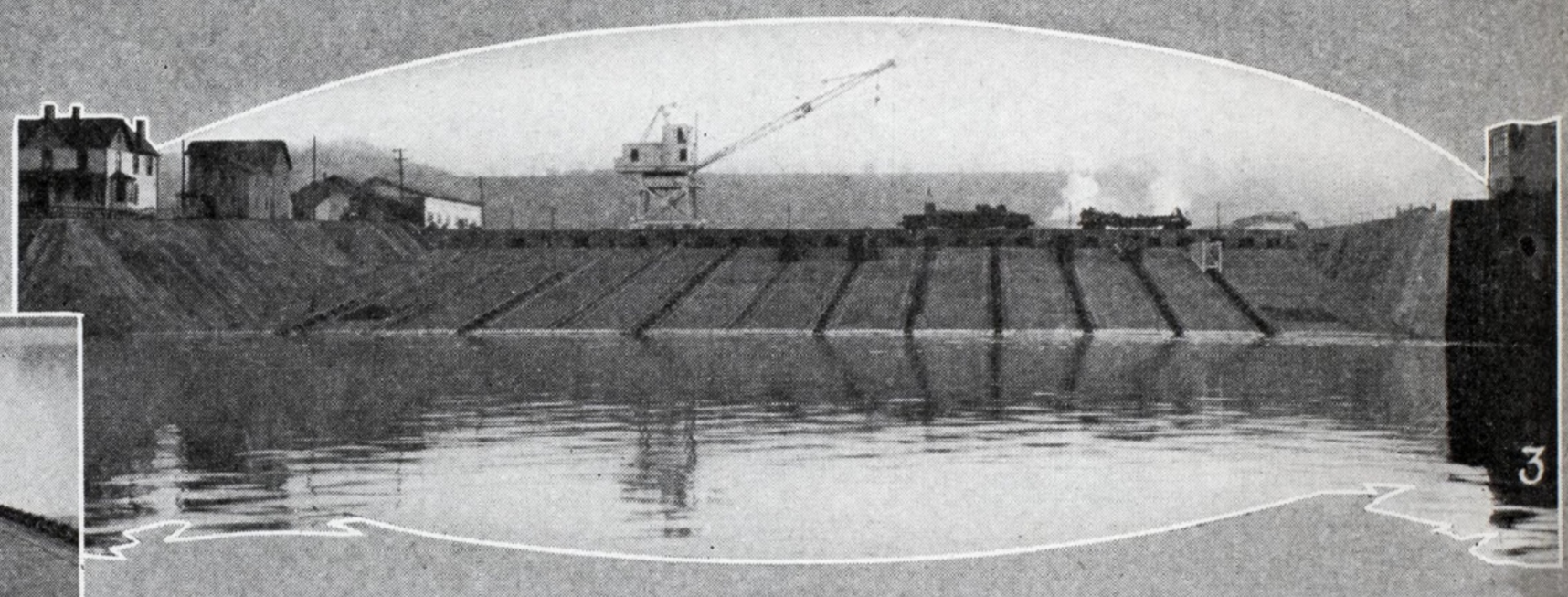

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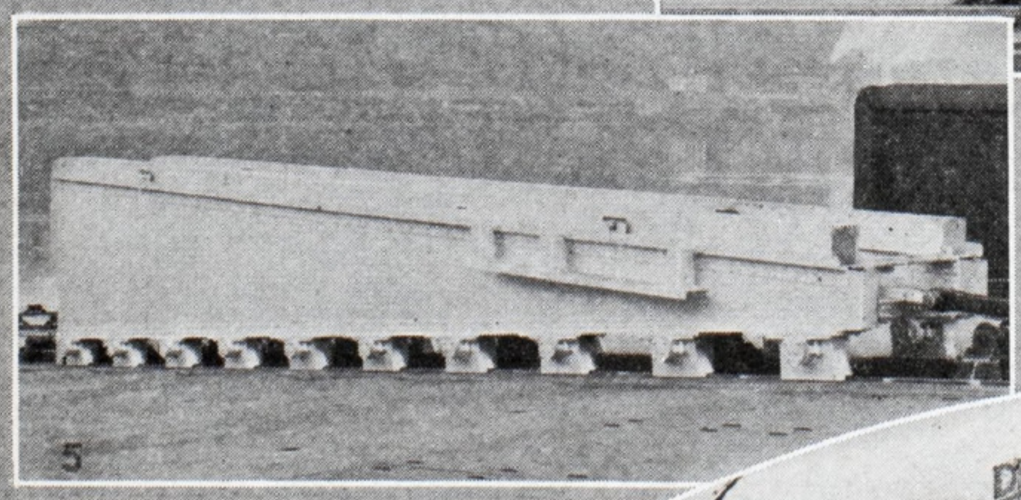

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New Marine Railway for River Use

Original Features of Design and Construction—Side Haul Type—Carriages Move at Uniform Speed—Solid Foundation—Sturdy Mechanism

By W. G. Gude

EASE of manipulation and sturdiness of design characterize the modern Neville Island marine railway officially opened by the Dravo Contracting Co. Jan. 15 at its Neville Island plant and yards, located on the Ohio river eight miles below Pittsburgh, before an audience of more than 200 invited guests. Representative of the progress and expansion taking place in inland river transportation and transportation facilities this railway incorporates the latest developments in this type of equipment and fills an important post in offering adequate service for upkeep and repair to craft in the Pittsburgh and upper Ohio river harbors. It was designed with the greatest possible care after a thorough investigation of several installations in the United States, Holland and Germany, none of which was found adequate in all respects.

The railway will handle vessels with maximum length of 315 feet and draft of 10 feet. Capacity of each of the 12 carriages is 300 tons, giving total hoisting capacity of 3600 tons. Carriages are 46 feet long, weigh 30 tons each, are spaced 23 feet between centers and each is driven by a 25-horsepower electric motor. A central system of electric control handles the operation of the 12 carriages and is so arranged that any number of carriages may be operated simultaneously from one master switch. The control room is conveniently located to provide the operator a clear view of the ways.

Each hauling winch consists of a four reduction spur gear unit mounted on a structural steel base, the motor speed being reduced to 0.94 revolutions per minute at the sprocket, or equivalent chain speed of 5 feet per minute for maximum loads. The movement of empty carriages, with or without light loads at the rate of 10 feet per minute, is provided by a suitable speed change unit. Each winch is provided with a magnetic brake and as a further safety measure, a mechanical brake. The carriages run sufficiently into and under the water to accommodate loaded boats of draft as high as nine or ten feet.

Important features in the design of the Dravo railway are the ability to haul out the carriages at a uniform speed that prevents undue stresses or strains on either the hauling mechanism or the vessel; the conveniences offered for blocking up the vessel; and the sturdiness of foundations and mechanism. The foundation for the tracks is unusually substantial. The area between the carriage tracks is noteworthy because, instead of the usual type of step construction, it is made of alternate flats and slopes, the flats providing landings for the blocking under the vessels and the slopes facilitating the movement of men under the hulls or on any part of the ways. Pits have been provided at both the upper and downstream ends of the marine ways and at various locations to aid in the removal or installation of rudders or propellers.

The main hauling chains are of the flat bar and pin type, made of high manganese high carbon steel and designed for a working stress of 40 tons at a speed of 5 feet per minute. The back haul line consists of ⅞-inch steel rope. The machinery house enclosing the hauling winches extends completely across the upper end of the ways with its walls serving as a foundation to carry a gantry whirler equipped with an 80-foot boom. This crane is used to assist in repair work and for the purpose of placing blocking under the vessels being docked.

Neville Island Marine Railway

Maximum length vessel, feet	315
Maximum draft vessel, feet	10

Carriages

Number	12
Length, feet	46
Weight each, tons	30
Spacing between centers, feet	23
Capacity each, tons	300
Total capacity, tons	3600

Tracks

Gage rail centers, feet	5
Length above pool, feet	235
Length below pool, feet	160
Slope, inches per foot	1½
Depth of water over lower end, ft	20

Chains

Weight per foot, pounds	90
Total weight each chain, tons	17

Winches

Motors—each, horsepower	25

Sprockets and pinions—forged integral with shafts.
Control—full magnetic from remote station with single operator able to move any number or simultaneously any combination of carriages.

Hauling Speed

Heavy loads, feet per min	5
Light loads, feet per min	10

Constant Speed

Maintained by magnetic clutches on each winch connecting same to line shaft.

Whirler

Capacity: 30 tons at 30 foot radius; 15 tons at 60 foot radius; 10 tons at 80 foot radius.

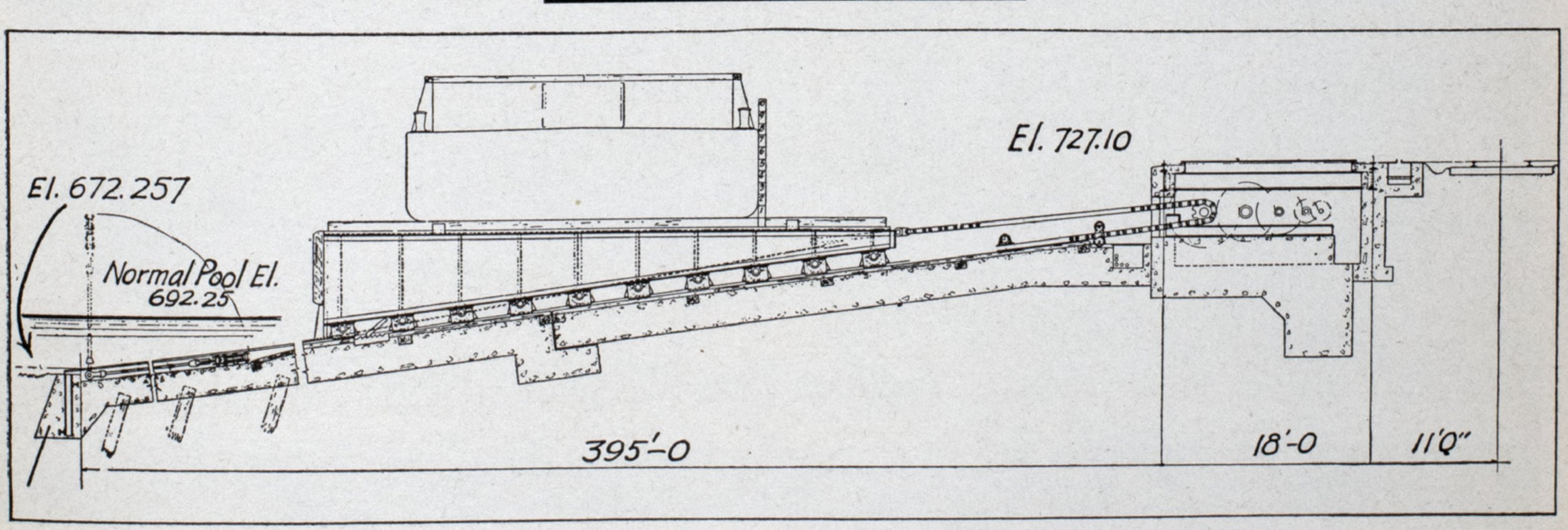
Length of boom, feet	80
Diameter of roller circle, feet	17

Rudder Pits

Three (3) supplied to permit dropping rudders 12 feet below bottom of hull.

Concrete Construction

Track beams of reinforced concrete—9 feet wide by 3½ feet deep—18 inch steel beams under rails below pool and 8 inch beams above pool.
Pavement above pool 12 inches thick with flat steps at 8 foot centers for blocking—below pool sloping pavement 10 inches thick.



Carriage and Hauling Mechanism of New Marine Railway, Dravo Contracting Co. Yard, Neville Island, Ohio River

Hydraulic Couplings on Kota Agoeng

Twin-Engined Single Screw Diesel Drive with Total of 5200 Brake Horsepower —Reduction in Size of Main Engines Increases Ship's Carrying Capacity

THE motorship KOTA AGOENG, completed in October, 1930 by the Fijenoord Co. for the Rotterdam Lloyd line, is a twin-engined single screw cargo vessel powered with diesel engines driving through Vulcan hydraulic couplings and reduction gear. This new motorship is of the three-deck type with a forecastle, bridge and promenade deck. The principal dimensions are: Length overall 464 feet 6 inches, beam 60 feet 6 inches, draft 26 feet 7 inches, deadweight capacity 9640 tons, engine 5500 brake horsepower and service speed loaded 14½ knots. The application of comparatively high speed diesel engines driving through Vulcan hydraulic couplings and reduction gear has been carried out in numerous vessels abroad. However, only two instances are on record where this system has been adopted on cargo vessels with double acting motors. One of these ships is the WULSTY CASTLE built over two years ago and the other is the KOTA AGOENG. The vessels of which the KOTA AGOENG is typical are fast diesel engine cargo liners of the highest class. The KOTA AGOENG was built under special survey to Lloyd's highest classification.

The vessel has a normal passenger capacity of 14. The captain's sitting room is located on the bridge on the port side with a sleeping cabin amidships and chart room on the starboard side. On the promenade deck below is the smoking room and two cabins for passengers. The dining saloon is on the bridge deck. The engineers' cabins, providing accommodations for the chief, second, third, fourth, two fifth and two sixth engineers and also one electrician, are aft of the galley on the port side. On the starboard side there are cabins for four officers. The crews quarters are on the main deck forward. Also on the main deck aft of midships to starboard are the insulated provision rooms. Lavatories and an emigrants galley are arranged aft. Immediately aft of these spaces is the stearing gear.

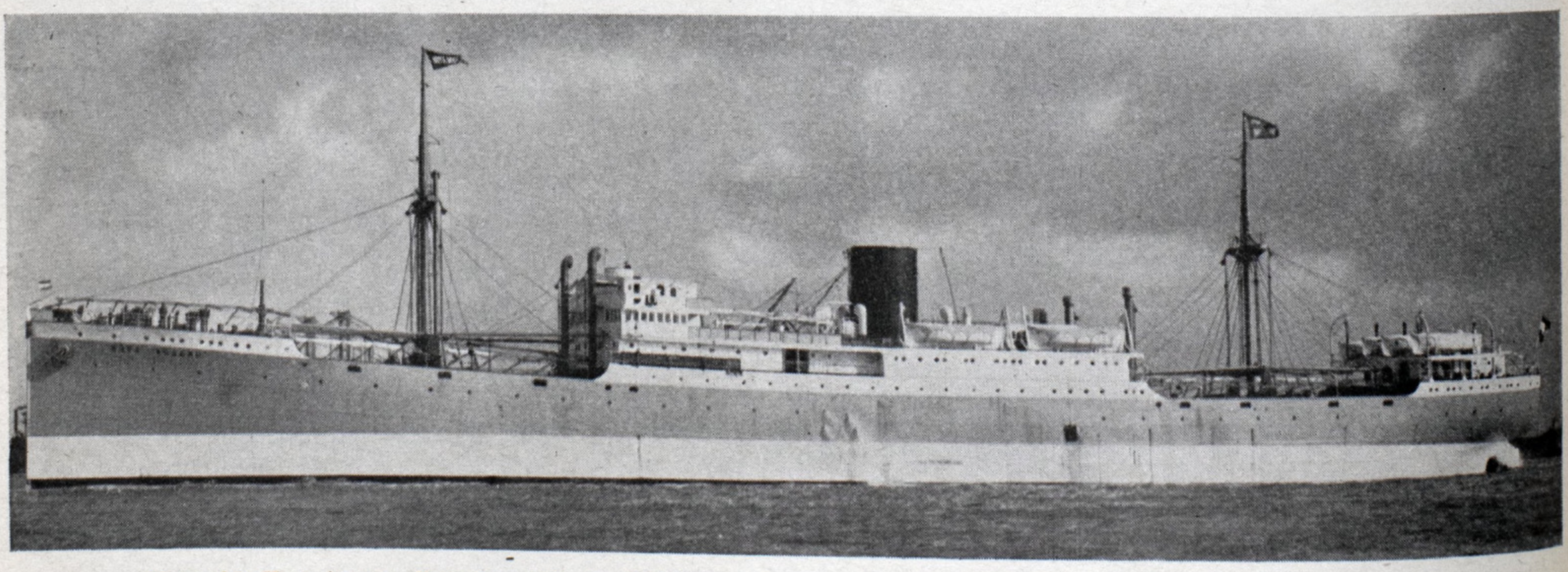
The KOTA AGOENG is fitted with two Fijenoord M. A. N. diesel engines running at 215 revolutions per minute and driving the tail shaft at 86 revolutions per minute. There is a very noticeable reduction in the size of the main motors as compared with a normal slow-speed direct drive. This reduction in the size of the main engines has increased the cargo carrying capacity of the KOTA AGOENG 140 tons compared with that of her sister ships. The total brake horsepower of the machinery is 5500 while the output of the tail shaft is 5200 brake horsepower. The diameter of the cylinder is 20½ inches with stroke of 27 9/16 inches. The engines have five cylinders each with a mean effective pressure of 58.5 pounds per square inch. The speed of the pistons is 990-feet per minute. Both of the main engines drive a double acting tandem scavenging air pump in a three-stage blast-air compressor. The scavenging air suction pipe extends to the boat deck.

The Vulcan gearing consists of a single reduction gearing, the two pinions of which are each driven by a diesel engine through a hydraulic coupling. These couplings have the very great advantage of being very elastic, so that the shocks produced by the comparatively irregular torque of the diesel engines, is not transmitted to the gearing. The fact that the size of the shafting back of the reduction gearing may be calculated according to formulas of the classification bureau rules for turbine equipment, so that the shafts are considerably lighter, is outstanding proof of the advantages of this system. Compared with the sister ships, the saving in weight of the tunnel-shafting in this installation amounts to about 20 per cent.

By taking into consideration the critical speeds of the engine, this may be so designed together with the coupling, that no critical speeds occur throughout the entire operating range of the installation.

A further advantage results if the sailing schedule of the vessel requires reduced speed during part of the trip. This can be attained by cutting out one of the engines, while the other drives the propeller under full power, and thus operates with best fuel consumption, which would not be the case with a directly coupled engine where the trip would have to be continued with a considerably underloaded engine. In case of damage to one of the engines, the trip may be continued with one engine, while the other is being repaired. Maneuvering in a harbor may usually be done with one engine, so that the starting air consumption will be appreciably lower than with a direct coupled engine of larger dimensions. It is therefore possible to considerably reduce the number of air storage bottles and also to reduce the capacity of the auxilliary air compressor.

One of the outstanding advantages of such an installation is undoubtedly the fact that it is possible to use short stroke high speed engines even of very high horsepower, while the speed of the propeller may be made



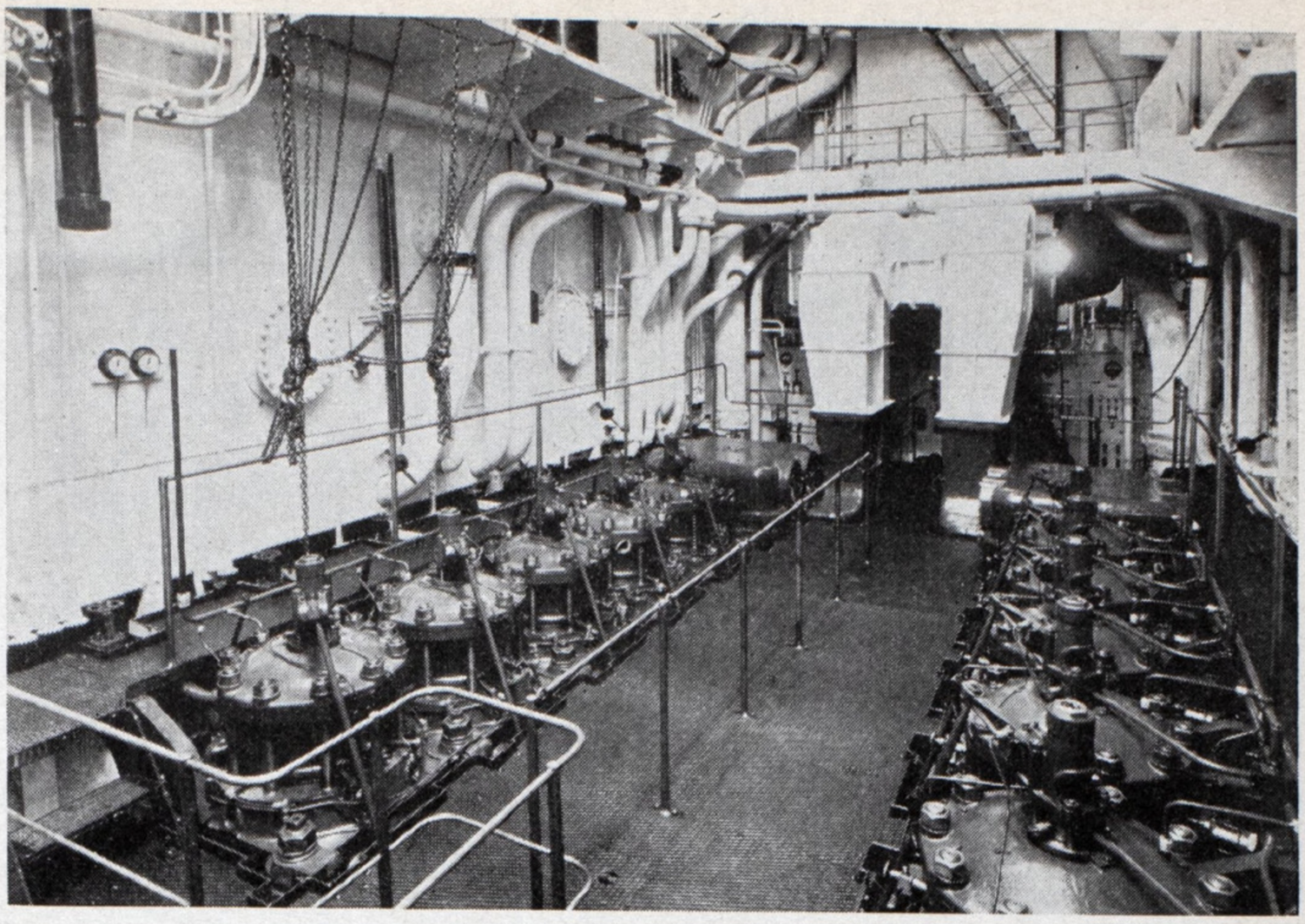
Motorship Kota Agoeng, Twin Diesel-Engined Hydraulic Geared Single Screw Cargo Ship Built for Rotterdam Lloyd Line

such that it will give best operating efficiency.

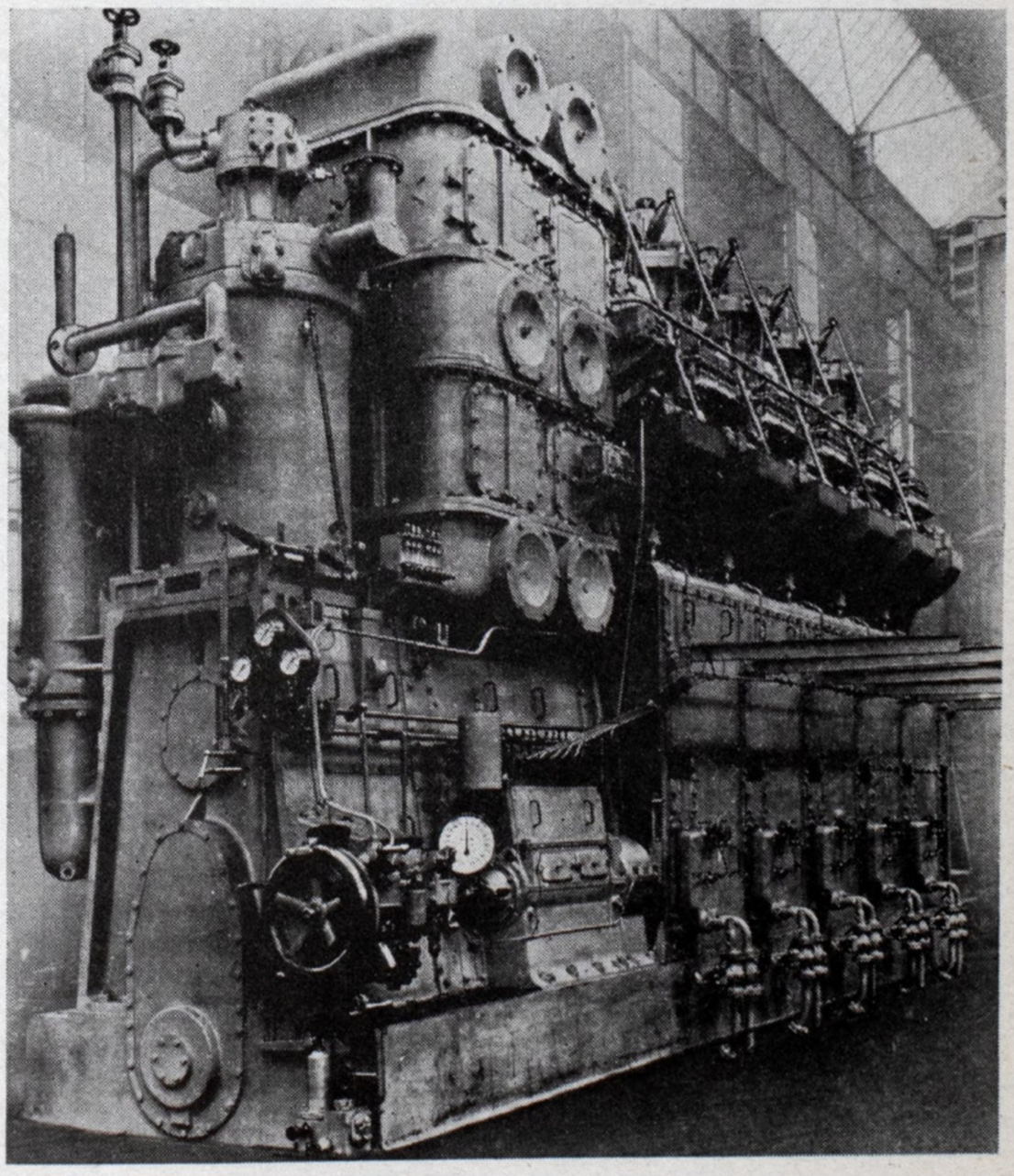
Short stroke diesel engines are of particular importance in passenger vessels, as the deck above the engine room may be extended considerably, which adds to passenger accommodations. The motor mailship St. Louis of the Hamburg-America line, with a total of 12,000 brake horsepower, divided between two propellers, each of which is driven by a double-acting two stroke diesel engine of the M. A. N. type, may be cited here as an example. Of the 29 installations with Vulcan gearing ordered since June 1924, mention might be made of the German cruiser A which is propelled by diesel engines with a total capacity of 50,000 brake horsepower.

The Vulcan gearing of the motorship Kota Agoeng was built by the "Deutsche Schiffs—und Maschinenbau A. G. "Weser" of Bremen. Each of the hydraulic couplings consists of a primary and secondary impeller, which are mounted with their open sides facing each other. The impellers have cast-in radial buckets. The two primary impellers are attached to each diesel engine, while the secondary impellers are attached to the two pinion shafts, both pinions meshing with the large gear attached to the tunnel shaft. A single disk thrust bearing is also installed in the gearing. The gear reduction between pinion and the large gear is 1:2.41.

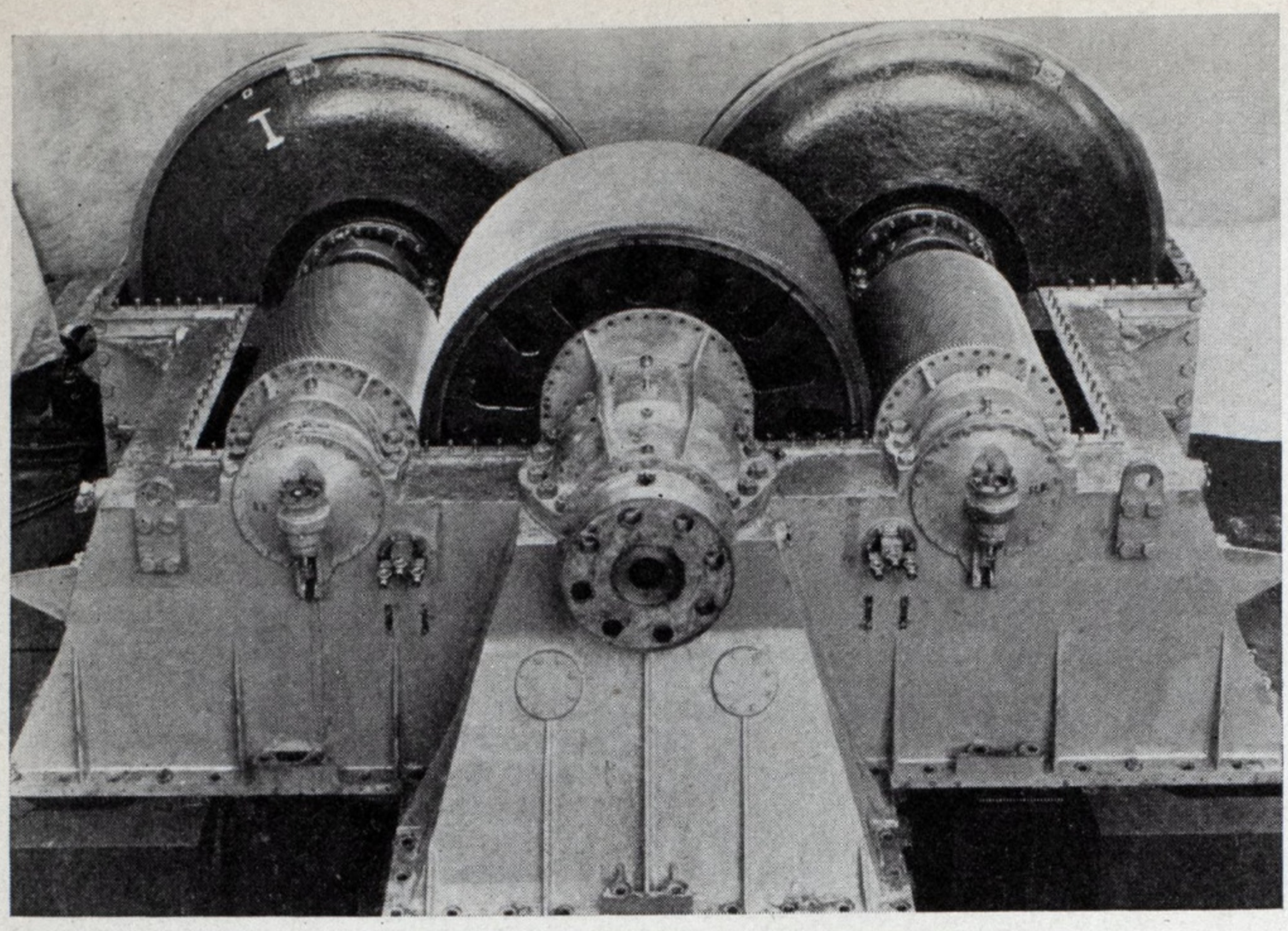
A bolted cast-iron cover completely encloses both primary and secondary impellers and a labyrinth bearing seals the secondary shaft. The clearance between the two impellers is 10 millimeters (0.393 inches) their diameter being 2650 millimeters (8.59 feet). If the primary impeller is rotated by the engine while the coupling is filled with oil, the secondary impeller will be dragged along with a certain percentage of slip, while the fluid circulates in the couplings whereby the fluid is projected radially. The per cent slip in this installation, under normal operating conditions, is 3½ per cent. The couplings are filled with lubricating oil, which is supplied under slight pressure through the hollow pinion shafts. A number of holes are drilled in the periphery of the primary impellers, through which the couplings may be emptied. These holes may be closed by means of an axially slideable sealing ring. As previously stated, 3½ per cent of the input is absorbed in the couplings under normal operating conditions, which causes the oil to heat. In order to hold this heating within permissible limits, the oil is kept circulating continually, by keeping the valves in the oil supply lines on the ends of the pinion shafts open, which at the same time compensates for any leakage losses. The heated oil flows through the labyrinths, along the pinion shaft, into a drain tank built into the ship's double-bottom under the reduction gear. If a coupling has to be drained, the supply valve is closed, and at the same time the sealing ring is shifted by means of rods so as to uncover the holes in the periphery of the primary impeller, so that the oil very quickly drains away. This operation is performed independently on each coupler, by means of a lever located at the control stand of each engine. The entire coupling and gear reduction is covered over with a cast-iron cover. The oil required for filling the coupling and lubrication of gears and bearings is supplied by one of two electrically driven rotary pumps of which one acts as a reserve or standby. The pumps are of the horizontal type and are driven through a worm-gear reduction by a vertical electric motor. Each pump has a capacity of 100 cubic meters of lubricating oil per hour against a head of 35 meters. The lubricating oil is drawn from the drain tank of the Vulcan gearing and delivered to the gravity tank after first passing through the lubricating oil cooler having a cooling surface of about 28 square meters. From the gravity tank the oil flows to the two regulating valves of the couplings, to the pinion sprayers and to the bearings. A magnetic strainer supplied by Smith, Lemon & Stewart Ltd., is installed in the suction line of the pump, while a set of filters is introduced in the delivery line. The centrifugal pump, with a capacity of 60



View in Engine Room Showing Tops of Cylinders of the Two Diesel Engines of Motorship Kota Agoeng. Each of Engines is connected to a Hydraulic Coupling



One of the two Fyenoord M. A. N. Diesel Engines Installed in Motorship Kota Agoeng. Total Brake Horsepower of Both Engines 5500. Drive through Vulcan Hydraulic Couplings and Reduction Gearing. Giving a Total of 5200 Brake Horsepower at Propeller Shaft



Vulcan Hydraulic Gearing on Motorship Kota Agoeng

cubic meters against a head of 30 meters, supplies the sea-water required for circulating through the cooler, the sanitary pump acting as a reserve.

As in normal operation the load is to be equally divided between both main engines, the control gear is coupled together in such a manner, that both engines may be controlled from one central control point, this being located at the starboard engine controls.

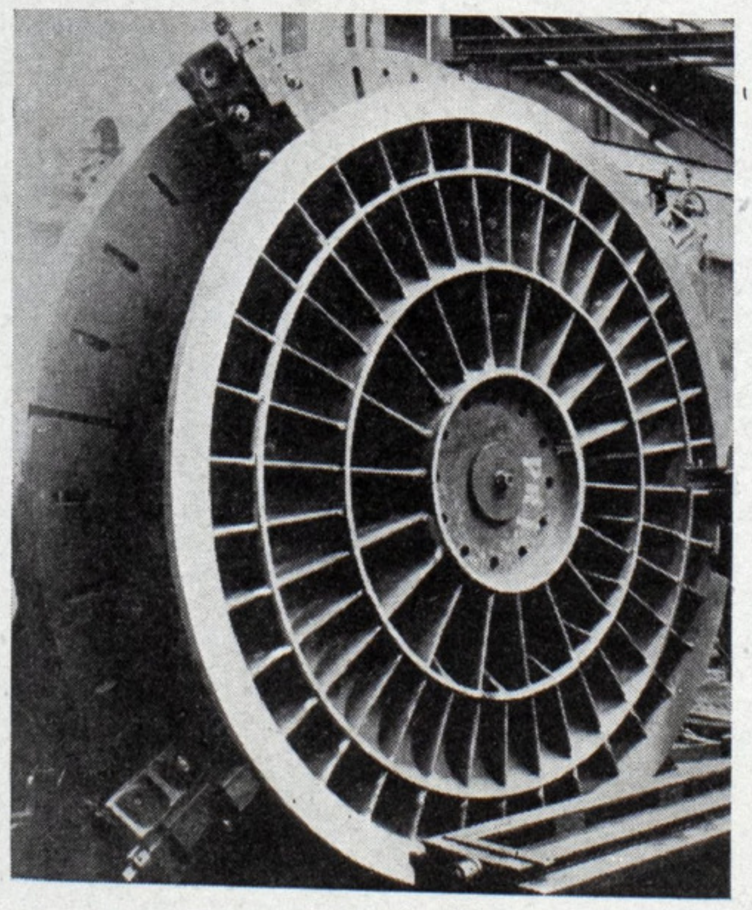
Since, as is well known, all operations for reversing, starting and speed regulation on the Fijenoord M. A. N. diesel engines, are accomplished by means of a single hand-wheel, a simple solution has been found therefor, by connecting together the shafts of the control wheels by means of bevel gears and intermediate shafts. The controls for the reversing valves for forward and reverse are also connected together by means of rods. In case only one engine is functioning, the above mentioned connections may be easily disconnected.

Due to the fact that when the couplings are empty there is no connection between the two engines nor with the propeller shaft, it was necessary to provide the engines as well as the propeller shaft with a turning gear. When any one of the three is in mesh with the turning gear, the controlling gear is locked out automatically.

The auxiliary engines consist of three diesel driven dynamos, two of which are for normal use and one for harbor purposes. The two large dynamos are driven by three-cylinder four-stroke Fijenoord-M. A. N. engines each rated at 300 brake horsepower and having a speed of 250 revolutions per minute. The diameter of the cylinder is 16¾ inches and stroke 23⅝ inches. The dynamos have an output of 200 kilowatts apiece. One machine is able to supply all the current necessary at sea and when handling cargo. These engines are arranged to drive fresh water cooling pumps for warming the main engine jackets in cold weather.

Aft of these dynamos is an M. A. N. compressorless four-stroke engine for harbor use. This motor is coupled to a 50 kilowatt dynamo, has four cylinders and is rated at 75 brake horsepower at 275 revolutions per minute. Two auxiliary air compressors are provided. One has a capacity of 550 cubic meters of free air per minute compressed to 75 kilograms per square centimeter while the other fitted for emergency purposes only has a capacity of 15 cubic meters of air compressed to 75 kilograms per square centimeter. The refrigerating compressor is driven by an 11 to 14 horsepower motor running at between 150 and 180 revolutions per minute. This apparatus is of the ammonia type.

The deck machinery is entirely electrical and comprises 11 cargo winches each with a capacity of five tons, while there are four designed to lift three tons apiece. There are two electric cranes on the boat deck each with a lifting capacity of two tons. The anchor windlass is located forward with the motor below. The motor drives a horizontal worm shaft which operates a vertical shaft carried up to the windlass. This motor is of the compound wound type and is rated at 48 horsepower with the maximum speed being 720 revolutions per minute on a half-hour rating.



One of the Vulcan Coupling Impellers on M. S. Kota Agoeng

While being a standard cargo vessel as regards the design of the hull, the KOTA AGOENG is of particular interest from a machinery installation point of view. It is understood that the intention of the Rotterdam Lloyd line is to consider the Vulcan geared drive with a view to its application to passenger ships due to its saving of overhead space.

During the trial runs of this vessel very satisfactory results were noticed; the engines performed efficiently, the gearing was reasonably silent, vibration limited and the maneuvering ability notable.

Distance Tables Are Ready

The coast and geodetic survey, department of commerce, Washington, recently issued a publication on *Distances Between United States Ports* which should prove of value to those interested in the factors affecting transportation by water. The publication gives tables from which the shortest distance can be obtained between practically any two ports of the United States, its territories, and its possessions. The tables give distances between ports on the Atlantic, Gulf, and Pacific coasts, on the Atlantic coast inside routes, on the Hudson, Mississippi, and Ohio rivers, on the Great Lakes, in the Virgin islands, Porto Rico, Philippine, and Hawaiian islands, and between United States and a few foreign ports. A table showing time required to run various distances at different speeds is also included in the publication.

Prepare New Light Lists

The lighthouse service, of the department of commerce is now preparing new editions of its light lists. The reprinting of these light lists involves the verification of several thousand items. They are divided into three main sections and will be corrected to the following dates: Atlantic and Gulf coasts to Dec. 15; Pacific coast to Jan. 1; Great Lakes to March 1. The first two lists will be ready early in 1931, and that for the Great Lakes with the opening of navigation in the spring.

The new Pennsylvania railroad terminal at Jersey City, N. J., known as the "rail-to-keel" terminal, was formally opened on Jan. 6.

New Tanker Virginia Sinclair Now in Operation

THE tanker VIRGINIA SINCLAIR, built at the Fore River plant of the Bethlehem Shipbuilding Corp. Ltd., Quincy, Mass., for the Sinclair Navigation Co. is now in operation. This vessel was launched Oct. 9 and was christened by Miss Virginia Sinclair in whose honor the ship was named. The VIRGINIA SINCLAIR is the first American tanker to be built with double longitudinal bulkheads in lieu of the single center line bulkhead. She is a late type of bulk oil tanker for ocean going service and was constructed to the highest classification requirements for such a tanker. The principal dimensions are given in the following table:

Length overall	435 ft. 0 in.
Length between perpendiculars	416 ft. 0 in.
Breadth molded	57 ft. 0 in.
Depth molded to upper deck	32 ft. 0 in.
Depth molded to upper deck center	33 ft. 2 in.
Draft to designers water line	24 ft. 0 in.
Speed	14 knots

This vessel is said to mark an advance over previous American and European tanker design. Advantages claimed are greater stability, higher speed, virtual elimination of fire hazard, decreased evaporation losses, elimination of cargo contamination and reduced construction and operating costs. Officials of the Sinclair Navigation Co. point out also that as a result of the higher speeds, the company will be able to reduce the average storage at terminals.

Methods and practices ordinarily used on naval cruisers and trans-atlantic liners are applied to the design of the hull so far as these have been found adaptable to commercial service. With the lines faired and fine, eddy losses are minimized and hull resistance greatly reduced. The vessel is fitted with 5000 horsepower De-Laval double reduction gear turbine propelling equipment which will give her a sea speed of 14 knots.

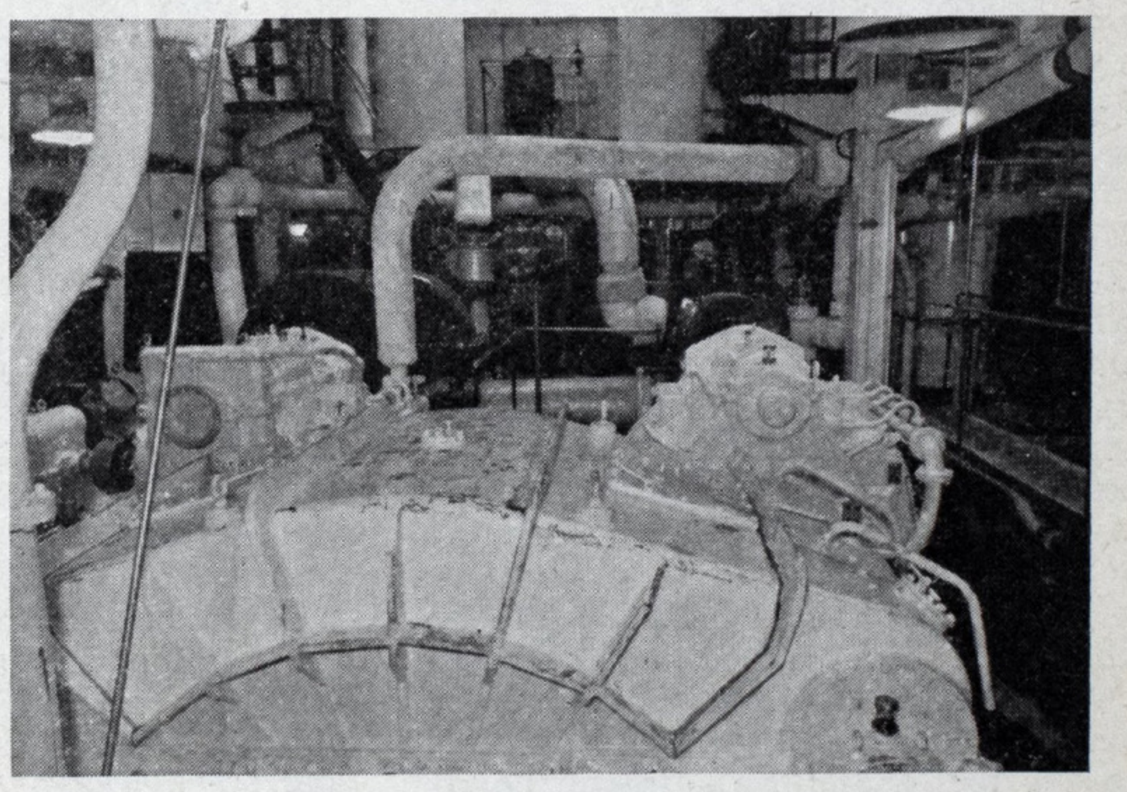
Other features which are summarized by engineers of the Sinclair Navigation Co. are as follows: Summer tanks have been eliminated; the Isherwood bracketless system of construction is employed. Iron rivets are used throughout to decrease corrosion; a sprinkling system covers the entire deck; the cargo tanks are fitted to withstand higher pressures. There are vents at the top of the mast and flame-proof spark arresters are fitted; special methods of cleaning tanks are employed. The pumping equipment includes vertical compound duplex steam pumps of high capacity, three pump rooms and three coffer dams with separate lines and pumps to each cargo compartment. Steam is supplied by water tube boilers at 400 pounds pressure and 200 degrees of superheat. The engine room auxiliaries are electrically operated. Feed water is heated in series heaters. The vessel is fitted with a gyro compass, mechanical steering device and full radio equipment for sending and receiving.

At the time of the launching of this vessel, the hull structural work, wood and outfit was about 95 per cent complete. The machinery was about 57 per cent complete. The boilers were on board but the turbines, reduction gear, and main condenser were not on board. The propeller blades were unprotected, with the propeller and shafting locked inside. The rudder was blocked inside with steel brackets at crosshead and tiller. In order to prevent any portion of the launching cradle from breaking away in the water, wire rope tricing lines were led from the after end of each sliding way section to the bitts on deck. After launching, the ship was towed to the dock, the wire rope hauling line attached to the cradle was thrown over a bitt on the dock, then all tricing lines were let go and the ship was towed off over the cradle which came out in good order.

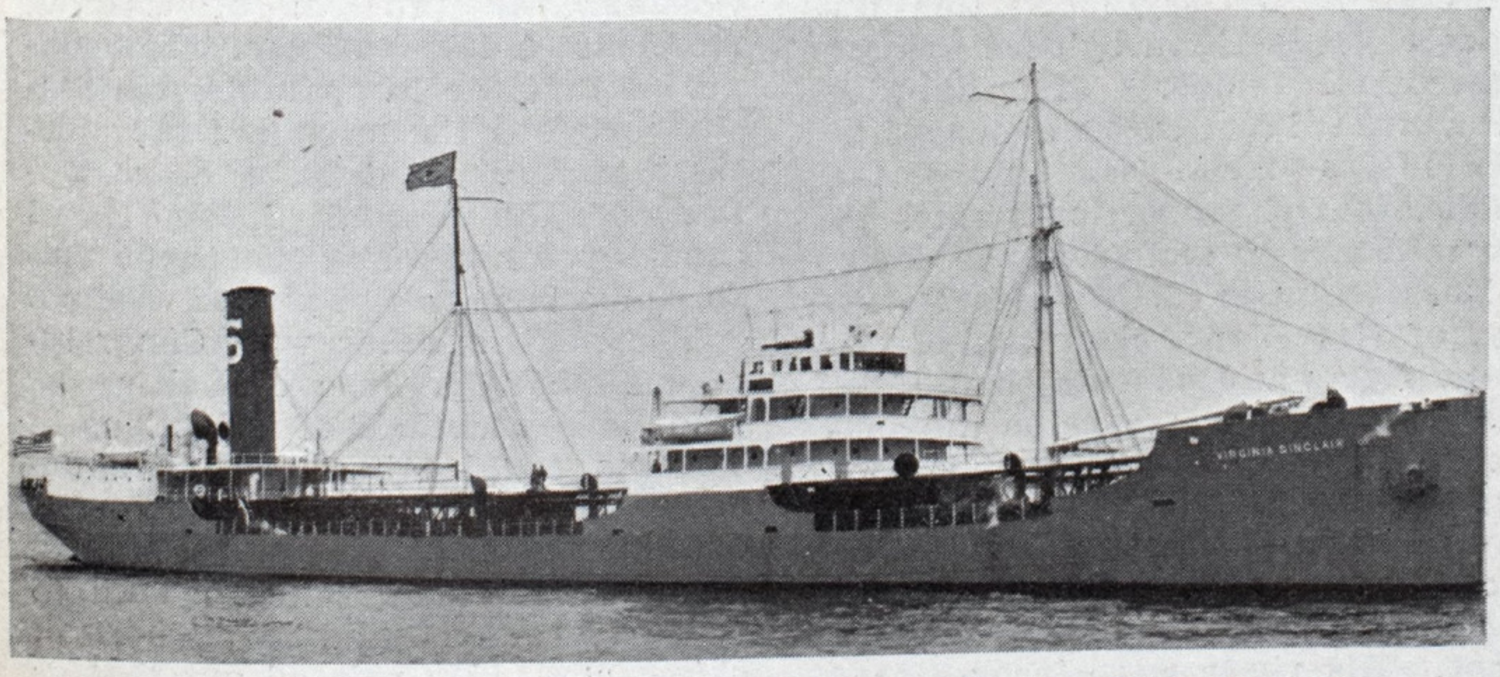
The speed and acceleration of the VIRGINIA SINCLAIR were obtained by means of a Denny-Edgecomb chronograph connected to a contact maker located at the outer end of the cradle and actuated by steel pins located at intervals along the sliding ways. The result obtained by the single recorder method was satisfactory.

Owing to the restricted length of the deep water basin, it was necessary to slew the ship's stern, so two sets of wire rope lines and concrete block drags were used. The first set used 1½-inch diameter wire rope and three concrete blocks; the second set consisted of 1⅜-inch diameter wire rope and four concrete blocks. The blocks were arranged to come into action as the cradle left the ways. In order to prevent a sudden shock, each weight was arranged to come on after the preceding weight had moved 10 feet. The second set of four concrete blocks was arranged to start while the first set was working. The blocks were connected to one another by wire rope pendants and shackles; each block weighed about 4000 pounds.

The first drag line, 300 feet long, was set at 14 degrees with the center-line of the ship; the second drag line, 460 feet long, was set at 23½ degrees with the center line of the ship. This created a larger turning moment. The ship's stern traveled in a straight line for 1½ lengths, then started to turn following a curved line about as designed. The slewing arrangement worked very satisfactorily. The creeping of the cradle was very slight.



Engine Room Tanker Virginia Sinclair—5000 Horsepower De-Laval Turbine Propelling Equipment——Speed 14 Knots



Tanker Virginia Sinclair Built at Fore River Plant, Bethlehem Shipbuilding Corp.

Fourth National Conference on the Merchant Marine

By L. M. Lamm

RESOLUTIONS favoring the federation of the Erie canal, condemning the program adopted by the Association of Railway Executives on Nov. 20 relating to waterway transportation and urging the building of naval vessels in privately owned shipyards were adopted at the conclusion of the fourth national conference on the merchant marine held Jan. 21 and 22 in Washington under the auspices of the United States shipping board.

In connection with the naval vessel resolution the conference stated that "it is the sense of this conference that costs of construction of naval vessels and their time of delivery in private shipyards being not greater than their construction in navy yards, the conference favors the construction in private shipyards of such vessels which are now authorized, or which may be authorized at the present session of congress."

It was pointed out that the railway executives in their action, which was condemned by the marine conference, proposes "to extend the jurisdiction of the interstate commerce commission to port to port water rates, and to permit railway-owned vessels to operate through the Panama canal, Great Lakes and other waters."

The keynote of the conference seems to have been the discussion of methods of increasing patronage for American ships and it was estimated that nearly 400 representatives of various branches of the shipping interests and government officials attended this fourth conference which was declared to have been the most successful yet held.

T. V. O'Connor, chairman of the shipping board, acted as chairman and made a few brief introductory remarks in which he called attention to the fact that "the shipping board is able to say, with considerable pride, that it has succeeded in transferring by far the greater portion of its vessel property to private interests. Its pioneering work having thus been virtually completed, its future efforts will be largely confined to developing and regulating privately owned shipping in foreign and interstate trade."

Greater governmental aid to American shipping to make specific provision for the construction in this country of passenger ships whose speeds shall be as great or greater than any of those operated by foreign lines was urged by Senator-elect Wallace H. White Jr., chairman of the house merchant marine and fisheries committee.

Mr. White proposed that the merchant marine act of 1928, of which he is co-author, should be amended so as to increase the rates payable under ocean mail contracts held by American lines payable through operation of the high speed ships. "We have made in our law," he said, "no adequate provision for the maintenance in that trade of the ships of higher speed. If we are going to have ships comparable to the BREMEN and the EUROPA and other vessels now building abroad we must have an amendment of the law. That should be one of the first tasks of the American congress and should be one of the first interests of those interested in American shipping."

Mr. White also called attention to combined operation of foreign ships in trades which are primarily American. In particular he referred to the Caribbean trade in which for the past few years foreign vessels have been operated during the winter season in competition with regular American services which are maintaining service throughout the year.

A discussion of the relationship between domestic shipping and the railroad and industrial companies of the United States was presented by Frank Lyon, attorney for intercoastal steamship companies which are operated independently. Mr. Lyon recommended that railroads and industrial concerns be prohibited from operating ships as common carriers in the coastwise or intercoastal service. He also recommended that congress give serious consideration to the enactment of legislation which would take from the interstate commerce commission the authority which it now has to authorize railroads to charge less for a longer than for a shorter distance over the same line or route in the same direction because of competition by coastwise or intercoastal ships. He likewise recommended that congress enact legislation to make mandatory the publication of proportional rates by the railroads to and from the ports.

Representative S. Wallace Dempsey, of New York, chairman of the house rivers and harbors committee, addressed the conference on the subject of the Erie canal and the pending proposal to place it under federal control. Mr. Dempsey urged this procedure as an important step in national inland waterway development. His views were incorporated in a resolution which was adopted by the conference as indicated above.

Efforts which have been made recently to place domestic shipping under the jurisdiction of the interstate commerce commission were opposed in a resolution adopted by the conference. The resolution also opposes a pending proposal in the house of representatives for an inquiry by the interstate commerce commission concerning what extent and in what manner coastwise traffic should be submitted to government regulation.

Mr. J. L. Banham, president of the New York board of trade and vice president of the Otis Elevator Co. proposed that the steamship companies give attention to cruises in nearby waters such as the Caribbean. He suggested also that they give far more attention to publicity and advertising than they have in the past.

In its report to the conference, the committee appointed last year to study the question of training officers for the merchant marine expressed opposition to the use of the naval academy or the coast guard academy as training schools for merchant marine officers. The committee recommended, however, that a national system be established for this work. These recommendations are based on responses to questionnaires sent out during the past year.

Problems of liquidating the huge government fleets created during the war were outlined before the conference by J. Caldwell Jenkins, vice president, Merchant Fleet Corp. "The liquidation of the property and the functions of the Merchant Fleet Corp. that are of greatest significance to the American merchant marine," he said, "do not consist in dismantling ships or suspension of actual ship operation, but consist rather in the surrender to private steamship companies activities which the government has heretofore been carrying on.

While other lines of American enterprises are operating at levels far below those of a year ago, employment in American shipyards is fully 10 per cent higher than it was at the close of 1929, said Secretary of Commerce Robert P. Lamont.

Secretary of the Navy Ernest Lee Jahncke, urged the conference to consider the problem of training merchant marine officers. He suggested that the inseparable relationship between the navy and the merchant marine would make the utilization of the United States Naval academy for training merchant marine officers seem the part of wisdom.

The next speaker was Congressman Arthur M. Free of California, who spoke in behalf of reductions in Panama canal tolls. Mr. Free declared that the present system of dual measurement of ships passing through the canal is unfair both to the government and to American shipowners. He pointed out that at

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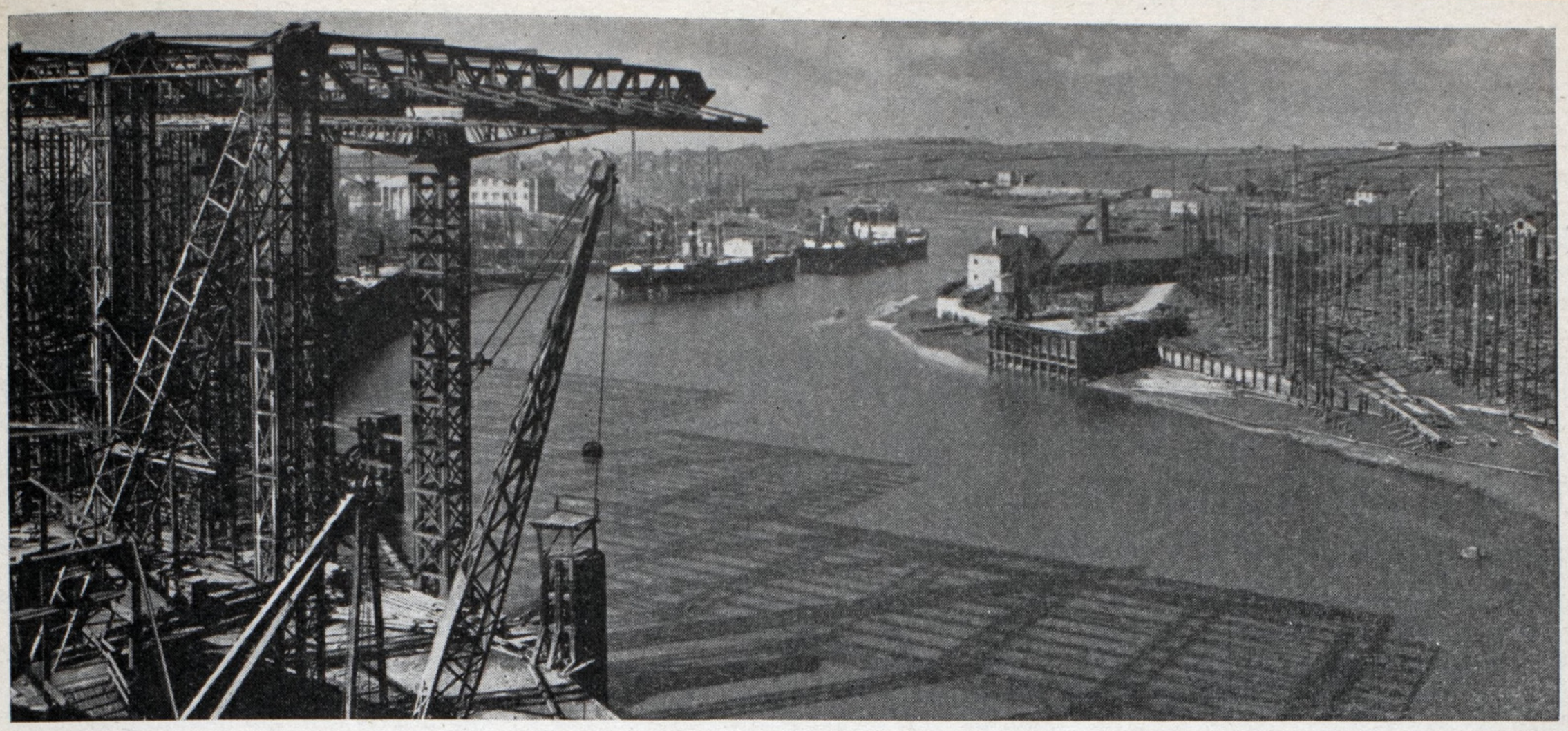


The Shipyard District of Sunderland on the Northeast Coast of Great Britain

British Shipping Still Continues Dull

Final Quarter Less Satisfactory — New Vessels Forced into Lay-Up — Tanker Market Depressed — Over 40 Per Cent of Shipyard Labor Unemployed

BY FRANK C. BOWEN

THERE can be very few who are in any way concerned with shipping and shipbuilding in Europe who are not glad to see the end of the year 1930, for it belied all the previous prophecies that the rock bottom of the slump must have been reached and showed how bad the allied industries really could get. Hope has been deferred so long that now shipping and shipbuilding men are giving up any sort of prophecy as to when the revival will come and are leaving it on the lap of the gods in a fatalistic manner that is somewhat strange to them, doing all that they can to economize in every direction and effecting savings that have not hitherto been considered, but not daring to hope too much of the immediate future.

It is not difficult to understand this attitude, for the last quarter of 1930 contrived to be just a little less satisfactory than the three that had preceded it, although that would appear to be difficult. As far as the shipping business is concerned there have been one or two flashes which looked as though some revival might be expected, but within a very short time it was the old disappointment and the estimated index figure for the year 1930, in spite of the little spurt caused by the large scale Russian chartering, works out at 72.5, the year 1923, which was regarded as being bad enough, being the unit of 100.

Many ships which were ordered when a revival appeared likely, and when shipbuilding costs could not conceivably be lower, have gone straight to the laying-up berths as soon as they are ready for sea. In Great Britain practically every convenient place is now full and ships have to lay up in most unsuitable spots remote from almost anything. There is but little comfort in the thought that practically all the other European countries are in similar plight, only France and Italy having very few ships laid aside at the moment and that mostly due to State aid which carries its own disadvantages.

The tanker market is still very depressed, it being practically impossible to get a time charter for even the most up to date tonnage, and as a natural result the orders which were the only bright factor in the British shipbuilding situation some months ago have now ceased entirely. It is difficult to say whether there will be a very decided revival in the tanker market, for the long-promised revival of Russian exports on a large scale, now apparently near at hand, will have a tendency to hit it still further by substituting a short voyage for a long one. Part of the present slackness in tankers is undoubtedly seasonal, with such a large number of private cars and passenger vehicles laid up for the winter, but a very large part is due to a reduced demand for oil fuel owing to the number of ships laid up. The suggested curtailment of production in the United States will be the last straw in this market.

In the passenger business it has been found necessary to rationalize the services more than ever before and the western ocean companies have made big strides toward putting down wasteful competition. This has caused a number of big passenger steamers to be laid up and has added to unemployment, but a revival is expected in the summer.

That this revival will not be complete unless there are an unprecedented number of holidaymakers is obvious from the added restrictions on immigration caused by unemployment all over the world. This has been particularly noticeable in Australia, where practically all the migration schedules have been held up and large numbers of Italian emigrants have been refused entry. At the same time the published figures show that the North German Lloyd have had the cream of the 1930 business, the publicity value of the blue ribband not being confined to the two fast ships, or even to the western ocean in any way.

The trade conditions of the world are also reflected by the necessity of the big lines making drastic cuts in the fares charged for their luxury accommodation, the greatest cuts recorded in the history of the companies

Trend of Trade and Shipping in the British Isles

	Sept.	Oct.	Nov.	Eleven months ended Nov. 30 1930	1929
Total entrances of cargo ships into British ports:					
Number of vessels	5,145	4,750	4,096	53,131	53,226
Tonnage	5,882,552	5,568,966	4,961,496	58,592,984	57,757,746
Tonnage from Atlantic coast of North America	1,407,024	1,295,811	1,008,249	12,281,065	12,304,225
	(24%)	(22.3%)	(20.2%)	(21%)	(21.3%)
Total clearances from British ports:					
Number of vessels	5,321	5,410	4,832	56,319	59,635
Tonnage	5,787,023	5,813,506	5,107,426	60,960,337	63,517,444
Tonnage going to Atlantic coast of North America	1,050,247	982,856	689,253	9,947,525	10,265,849
	(18.2%)	(16.9%)	(13.5%)	(16.4%)	(16.2%)
Total value of goods:					
Exported	L48,134,015	L54,131,090	L50,905,709	L613,830,639	L772,929,295
Imported	L78,651,726	L90,860,013	L79,411,947	L955,181,141	L1,115,284,826
Exports of coal:					
Tons	4,632,677	4,797,255	4,066,646	50,632,504	55,278,600
Value	L3,844,381	L3,953,745	L3,325,032	L42,208,794	L44,478,599
Tonnage shipped for use of steamers	1,437,183	1,302,806	1,209,162	14,340,547	15,071,194

and the cancellation of several yachting cruises which formerly were relied upon to find employment for passenger ships during the winter months.

The North German Lloyd and Hamburg American companies, having sunk their traditional differences, are reported to have in hand a five-year constructional program that will put on to the market half a million tons of new shipping which will be able, by its improved design and superior speed, to replace 600,000 tons at present on the various services of the two companies and their auxiliaries. This scheme is a good example of the difference made by a modern design, but it must be remembered that there are many of the most modern ships now laid up and many of the cargo liners which apparently have everything in their favor are sailing only half full or less.

Britain has been particularly hard hit all through the year by the decline in coal exports which always are and always must be the mainstay of the tramping business. Every district shows results below 1929 and although the total is above that of 1928 and nearly equal to 1927 it must be remembered that during both these years the industry was suffering badly from the results of the total coal stoppage of 1926.

In British shipping circles the main interest still centers round the Kylsant group, which continues to be blessed with the very worst of luck. The VESTRIS claims are still hanging over the head of the concern, and demands for additional cover are embarrassing at the present time, although considerable relief has been obtained by the sale of the Mihanovitch shares. The loss of the Nelson liner HIGHLAND HOPE, one of the most popular ships on the South American service which was wrecked on the Portuguese coast, came just at a time when the group could least afford it, either for the sake of the service or for the sake of prestige. Lord Kylsant himself is shortly going on leave to Africa for a spell and Mr. Walter Runciman, who is acting as chairman during his absence, has a colossal task before him. The Royal Mail Steam Packet preference dividend has had to be passed and as the earnings of the White Star line did not equal its own preference demand it has again had to call upon the Royal Mail Steam Packet under its guarantee. At the time of writing, it has not been announced what is to be done in this matter.

In addition to the loss of the HIGHLAND HOPE with a valuable cargo the underwriters have been hit during the quarter by the burning of the Canadian Pacific liner EMPRESS OF SCOTLAND just before scrapping commenced while quite a number of cargo steamers, mostly old but aggregating a large sum, have been lost. Although nothing definite appears yet to be settled, negotiations are admittedly in progress between the Nelson line and Messrs. Harland & Wolff, another unit of the Kylsant Group, for the replacement of the HIGHLAND HOPE without whom the London-River Plate service is sadly handicapped.

The British shipbuilding industry will be glad enough of this order, or any others that can possibly be put its way, for the present position is deplorable. According to the last report, which reckoned up to October, 40.1 per cent of the skilled shipyard labor in the country was out of employment, against 18.1 per cent for all trades. In December 1929 the percentage was 23, and it is anticipated that the figures for this December, when they are published, will prove to be at least double that figure. It is certain that on the Clyde and North East coast over 50 per cent of the shipyard workmen are unemployed, while the repair centers are naturally hit by so many ships being laid up and further by intensive competition on the part of the Continental yards.

As regards new orders, it is a little difficult to say just what business has been placed within the last three months as they are not always announced promptly, but the figures will certainly be no better than the quarter ending with September, when they were only one half the June quarter, one-fifth the March quarter and one-seventh of the quarter ending with December 1929. It has been suggested on good authority that there have not been more than half a dozen merchant ships of any real importance ordered from British yards during the last half year.

What the new year will bring forth cannot yet be accurately gaged.

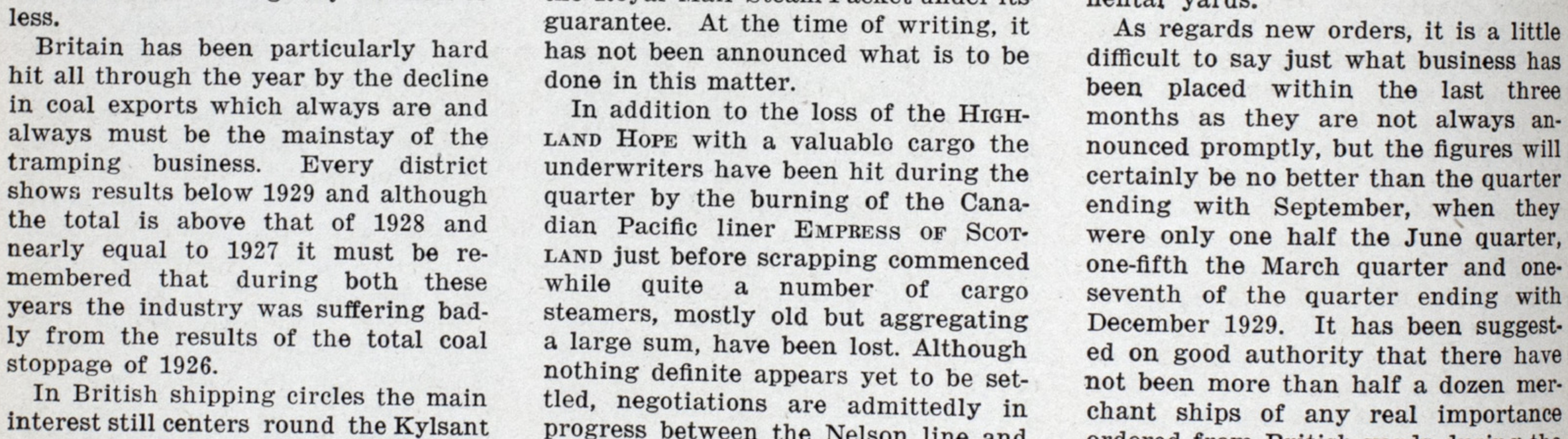

1926
1927
1928
1929
1930
Dec. Jan. Feb. March April May June July Aug. Sept. Oct. Nov.
60 55 50 45 40 35 30 25 20 15 10 5
"STATIST" INDEX OF BRITISH SHIPPING FREIGHTS
INDEX OF FREIGHTS BETWEEN U. S. A. AND WESTERN EUROPE
AVERAGE OF 1920 RATES TAKEN AS 100

DIAGRAM SHOWING FLUCTUATION OF OCEAN FREIGHT RATES FOR FOUR YEARS AND ELEVEN MONTHS

Developing Storm Warnings on the Great Lakes

BY GEORGE A. MARR

SURROUNDED in our homes, in our offices and plants and in every phase of our daily lives, as we are today, by a multipilicity of conveniences and utilities, we are prone to accept these aids and comforts as matters of course and look upon them with blase indifference.

The weather bureau was established by act of congress in 1890 superseding a similar service inaugurated 20 years before by the war department under a joint resolution of congress becoming effective July 1, 1871.

Under this joint resolution of congress, the secretary of war was charged with the duties of taking meteorological observations and giving notice on the seacoasts and on the northern lakes by "magnetic telegraph and marine signals of the approach and force of storms." The secretary of war was also authorized to establish signal stations at lighthouses and at such of the life saving stations on the Lakes or seacoast as were suitably located for the purpose. Lake commerce has therefore enjoyed for 60 years a storm warning service under the direction of either the war department or the present organization in the department of agriculture.

That the storm warning service was undertaken by the government primarily for the benefit of navigation is evident from the provision of the joint resolution of 1870 which authorized the establishment of marine signal stations, and also from the act of 1891 in which the duties of the weather bureau are enumerated in the following order: (a) Forecasting the weather; (b) Issuance of storm warnings; (c) Display of signals for the benefit of agriculture, commerce and navigation. Then follows the enumeration of a half-dozen other duties but the giving of warnings to commerce and navigation was the prime purpose of the government.

The means of communicating warnings to the vessels at the present time are: (1) The display of flag and lantern signals at land stations; (2) the radio telegraph broadcast; and (3) broadcasts from radio telephone broadcasting stations.

The distribution of storm information by the display of flags by day and lanterns by night is the primitive means of conveying the intelligence to ships' masters, and yet, in spite of the progress made by radio, these flag and lantern signals stand today as necessary to the safety of navigation as when they were inaugurated 60 years ago, and any thought of their discontinuance must be abandoned, or at least deferred indefinitely.

There are 115 such stations on the Great Lakes, 82 of which are maintained by our government and 33 by the Dominion of Canada. These are located at strategic points in the various harbors or at conspicuous places on the banks of the connecting rivers where vessel officers about to leave shelter may, seeing the warning, come to anchor until danger is past.

The Act of June 24, 1910, amended by the Act of July 23, 1912 makes it unlawful for any steamer of the United States or of a foreign country navigating the ocean or Great Lakes and licensed to carry or carrying 50 or more persons including crew to leave a port of the United States without radio apparatus of 100 miles radius, excepting as to vessels plying between ports not over 200 miles apart.

Under the provisions of this act none of the lake freight vessels is required to be equipped and only a few of the passenger ships. The lake vessels, however, have been equipped to the extent of 224 out of the 581 American vessels and 84 of the 294 ships of Canadian registry, leaving between five and six hundred vessels that are not equipped to receive advices by wireless telegraph.

For communicating storm warnings to these radio telegraph equipped vessels broadcasts are sent out at stated hours daily over the entire Great Lakes area. These broadcasts are sent in code from wireless telegraph stations at Duluth, Great Lakes, Chicago, Mackinac Island, Rogers City, Alpena, Cleveland and Buffalo, giving information as to both prevailing and expected weather conditions, and warnings of storms.

A deeply appreciated and highly commended additional service was established last year (1929) in an arrangement made through the weather bureau office at Duluth and the Radio Corporation of America radiotelegraph station in that port. Under this arrangement, reports are sent to Duluth from vessels on the open lake giving details of weather conditions prevailing in the vicinity of these vessels. This information is transmitted to vessels in port at Duluth and Superior where weather conditions are often of marked difference in character from those prevalent on the lake. Not infrequently masters, warned of severe weather on Lake Superior and of which there was no indication in port, remained in shelter until reporting vessels gave indication of moderation. So gratefully was this information received by masters that a similar arrangement was made during the season just closed to inform masters at Sault Ste Marie of the weather conditions on the east end of Lake Superior and the north end of Lake Huron.

As previously stated, the lake ships have been equipped far beyond the requirements of law, but the major portion of the commercial fleets of both United States and Canada is still dependent upon the flag and lantern displays. In addition to these unequipped vessels of the larger classes engaged in interlake trade there are numerous small craft, such as fishing vessels and yachts to which the flag and lantern displays are the only available warnings of threatened storm.

I have no hesitancy, therefore, in stating that no thought should be given at the present time to the withdrawal or material contraction of the primitive system of flag and lantern displays. On the contrary, if this service can be expanded to greater usefulness in the saving of life and property the study of the weather bureau should be directed to that end. For instance, these signals show merely that a storm may be expected from a certain point of the compass. If a simple revision of the code could be arranged to show the anticipated force of the expected storm, the additional information would be valuable.

I make the further suggestion that the weather bureau might render an added service by the forecasting of fluctuations in the lake levels, particularly in the vicinity of the shoal places governing the loading depths of the vessels. A number of years ago Frank Jermin, the meteorologist of the weather bureau at Alpena, Mich., made an extensive study of the effects of barometric pressure on the lake levels and the currents created by the transit of the high and low pressure areas from one part of a lake to another. The merits of Mr. Jermin's deductions I am not competent to discuss intelligently, but I have a distinct recollection that Mr. Jermin said that these water level fluctuations could be forecast with reasonable accuracy about six hours in advance of their occurrence. If this be true, may I not recommend to my weather bureau friends that consideration be given to the issuance of advance information with reference to these fluctuations?

The accompanying article is an abstract of a paper read by George A. Marr, vice president and secretary of the Lake Carriers association, before the American Meteorological society which held its annual meeting in Cleveland, Dec. 29-30, 1930.

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

THE duty of providing a safe berth is on the owner of the wharf, who is obliged to take all reasonable steps to keep the berth safe. —MURRAY RIVER, 38 F. (2d) 990.

* * *

WHERE special care is required by clauses in the shipping contract as to refrigeration and chambers with special temperature, reasonable care must be taken to see that it is exercised, and, if the carrier fails to exercise the care that is required, it may be liable for the damage, even where the nature of the damage, otherwise unexplained, is within an exception of the contract. —VESTRIS, 38 F. (2d) 992.

* * *

A CHARTER of a barge without motive power and with a captain furnished by the owner constitutes a demise which makes the charterer the owner pro hac vice, according to the case of O'Boyle v. McGirr Bros., Inc., 39 F. (2d) 637, and the charterer is liable for any damages sustained by the boat while under charter, resulting from his negligence, and the burden is on the charterer at least to account for the damaged condition of the barge which he returns.

* * *

IT IS well settled, it was said in the case of Bombace v. American Bauxite Co., 39 F. (2d) 867, that clauses in ocean bills of lading requiring prompt notice of damage to be given, and limiting the time in which suit may be filed, are to be enforced if reasonable. Failure to comply with the provision will bar recovery.

* * *

FOR the purpose of protecting the work and the instrumentalities engaged in channel improvements, the secretary of war may make rules to prevent collisions between vessels, in the area of the improvement, when it may reasonably be believed that such collisions would endanger the work or the instrumentality engaged therein. A custom to depart from the rules, if based upon safety and not upon mere convenience, is valid.—GOVERNOR WARFIELD, 39 F. (2d) 926.

* * *

WHERE there is direct testimony that there was a collision, it generally controls what has been termed "nice calculations" indicating that there was no collision.—CAPE FRANKLIN, 39 F. (2d) 971.

* * *

WHERE the presence of a following vessel is known, navigation justifying a leading vessel in changing her course without warning refers to normal and foreseeable changes of course.—Ocean Steamship Co. v. United States, 39 F. (2d) 553.

* * *

AN OVERTAKING vessel is bound to keep such a distance behind that she can avoid a collision while permitting the vessel ahead to have freedom of choice in her navigation both in respect to speed and changes of course. No duty is imposed on the overtaken vessel to maintain her speed for the benefit of the ship behind until she on signal assents to a passing and its attendant close approach or is advised that the overtaking vessel has come into a place of danger from which she cannot avert a collision without the assistance of the vessel ahead.—HOLLY PARK, 39 F. (2d) 572.

* * *

AN ERROR in judgment by those in charge of a vessel put in extremis may be excusable, declared the court in the case of WILLIAM A. PAINE, 39 F. (2d) 586, but only if the error was committed at a time of peril when collision seemed imminent.

* * *

THE rights arising as the result of a general average act must be regarded as a bundle of equities, declared the court in the case of CASEY, 39 F. (2d) 136. In such a situation in order that the owner of part of the common adventure may shift a portion of his loss due to sacrifice for the common good, his equity must clearly outweigh the equities of his coadventurers who through the average adjusters may seek to resist his claim. The ambit of a general average act is too narrow to include deterioration of cargo, for it embraces only damages to cargo which are solely attributable to the general average act—damages which could not have occurred except for that act. Recovery for damage by deterioration or decay of a perishable cargo due to delay is always based on fault in caring for it or on some other breach of the contract of carriage. Proceeding to a port of refuge on an occasion when the master justifiably considers it necessary to do so for the benefit of the adventure committed to his charge, is not a fault, but a duty, under well-settled doctrines of the maritime law. Damage resulting from deterioration or decay is usually and appropriately considered to be for the account of the owner of the goods.

* * *

A TUGBOAT owner is not an insurer, and his contract of towage is no defense against negligence in inspecting a towed vessel by the man in charge of the tow. Intervening negligence on the part of those in charge of a vessel being towed which resulted in damages from sinking cannot be charged against the towing tug on the ground of merger of the original fault with consequences caused by an intervening fault.—THOMAS J. CLEAVER, 39 F. (2d) 183.

* * *

WHERE one joint owner of a vessel executes a charter party, another joint owner which did not personally agree to the terms of the charter party was entitled to take advantage of the limitation of liability, provisions of the act of June 26, 1884, declaring that the individual liability of the shipowner shall be limited to the proportion of any or all debts that his individual share bears to the whole. —Successors de Esmoris & Co. v. Whitney & Bodden Shipping Co., Inc., 39 F. (2d) 191.

* * *

COMMON carriers in foreign commerce, charged with confederacy to restrain and attempt to monopolize carriage of general cargo by vessel, had the burden of showing that the agreement between them came within section 15 of the shipping act, excepting from the Sherman act certain agreements. Such carriers must, under the shipping act, immediately file with the shipping board copies or memoranda of agreements between carriers, concerning rates, competition, or other matters prohibited by statute, and failure to do so is violation of act which may be complained of.—United States Navigation Co., Inc., v. Cunard Steamship Co., Ltd., 39 F. (2d) 204.

* * *

CONTRACTS for salvage services are always reviewable by the courts, it was held in the case of McKnight v. New Orleans Coal & Bisso Towboat Co., 39 F. (2d) 457, and an award may be made more or less in order to do justice, according to the facts and circumstances of each case.

* * *

WHERE a libel, seeking indemnity for personal injury, relies on the general maritime law, rather than the merchant marine act, the court of admiralty will normally follow the analogy of the state statute of limitations. Departure from the normal rule is not justified by the neglect of attorneys of the libelant in prosecuting the admiralty suit, where presumption of detriment from delay has not been overcome.—Marshall v. International Mercantile Marine Co., 39 F. (2d) 551.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	539	2,497,454	521	2,454,917
November	485	2,194,780	470	2,144,883
October	530	2,546,629	548	2,636,414
September	591	2,877,309	556	2,693,493
August	554	2,716,668	586	2,855,323
July	578	2,717,787	616	2,815,336
June	585	2,722,344	559	2,596,692
May	592	2,697,642	643	2,955,826
April	558	2,662,532	574	2,601,047
March, 1930	546	2,490,027	562	2,470,228

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	80	206,778	55	144,471
November	87	226,006	46	122,107
October	85	231,460	53	144,530
September	87	232,781	52	147,365
August	92	244,206	55	144,201
July	96	246,866	68	151,861
June	92	240,323	72	169,627
May	105	271,618	64	143,167
April	89	236,257	63	177,289
March, 1930	96	285,754	58	190,093

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	91	287,347	50	174,971
November	77	248,220	61	232,826
October	96	321,092	65	208,695
August	115	305,649	101	299,454
July	152	325,325	110	222,555
June	152	325,325	110	222,555
May	163	362,849	114	274,019
April	105	298,347	76	203,497
March, 1930	85	271,423	57	193,317

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	23	55,605	23	60,126
November	21	46,182	20	40,916
October	17	41,667	20	45,989
September	32	53,423	28	49,428
August	36	69,765	36	72,282
July	42	83,987	42	84,939
June	39	70,119	34	60,536
May	31	46,797	33	52,619
April, 1930	17	47,308	20	52,313

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	9	36,380	6	25,318
November	13	46,927	5	18,597
October	10	37,269	5	22,305
September	6	28,972	3	16,265
August	7	29,532	4	16,388
July	10	36,403	5	19,623
June	6	26,588	4	18,640
May	7	28,953	6	23,794
April	10	44,564	6	24,407
March, 1930	7	31,668	5	23,382

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	27	107,300	52	197,628
November	30	122,020	53	208,266
October	40	155,991	54	207,118
September	30	122,022	46	182,641
August	32	125,137	46	174,985
July	30	118,919	53	193,425
June	31	122,569	48	175,167
May	32	122,714	49	179,845
April	32	121,646	46	167,358
March, 1930	26	103,710	44	159,420

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	120	390,126	127	429,048
November	116	384,877	117	376,725
October	139	452,905	127	402,155
September	150	475,928	138	424,976
August	130	412,209	125	396,421
July	132	444,823	144	455,226
June	153	486,645	157	481,837
May	152	457,169	150	463,958
April	166	502,204	179	529,912
March, 1930	141	438,638	139	433,168

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	44	92,341	63	174,384
November	22	65,716	56	141,242
October	21	72,517	58	153,410
September	21	48,971	66	168,922
August	28	66,765	50	139,710
July	27	63,721	60	144,446
June	23	52,701	43	109,274
May	28	58,214	53	131,768
April, 1930	14	35,914	61	178,792

Jacksonville

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	17	33,862	16	29,847
November	14	30,105	10	13,048
October	14	27,810	14	27,016
September	12	26,442	13	26,356
August	15	29,565	12	20,856
July	6	14,312	8	20,739
June	10	25,129	12	23,737
May	14	32,001	19	51,210
April	13	23,378	13	27,999
March, 1930	17	26,625	12	23,963

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930				
November	49	63,307	50	64,389
October	50	61,288	49	60,432
September	48	64,968	48	64,742
August	50	61,440	50	61,666
July	56	68,968	55	69,397
June	57	69,679	56	68,658
May	104	120,788	108	120,160
April	89	90,105	82	90,249
March, 1930	93	89,490	76	86,235

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	91	208,802	84	194,477
November	106	241,663	99	220,755
October	99	187,035	92	196,893
September	83	184,276	81	171,679
August	102	190,362	96	176,488
July	113	211,989	95	173,549
June	113	211,446	111	212,639
May	98	169,700	106	203,070
April	115	225,516	119	235,115
March, 1930	131	280,484	126	286,119

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	56	240,203	61	256,724
November	59	255,728	57	245,592
October	57	246,957	63	272,114
September	62	268,203	58	250,301
August	48	200,602	48	209,109
July	54	248,954	60	261,746
June	49	215,525	53	228,554
May	54	235,178	53	222,715
April	55	230,429	55	217,705
March, 1930	52	205,674	59	245,363

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930				
November	187	555,053	194	541,671
October	218	633,652	228	672,782
September	210	589,459	218	605,239
August	220	600,786	241	666,625
July	270	697,526	245	653,562
June	233	606,340	239	626,307
May	260	686,543	251	662,383
April	226	712,630	261	701,159
March, 1930	255	703,361	263	699,493

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930				
November				
October				
September	19	54,863	19	69,530
August	13	34,274	13	24,742
July	25	70,538	25	51,805
June	18	42,196	18	46,140
May	20	50,484	20	50,484
April	22	49,651	26	56,022
March, 1930	32	70,250	24	60,834

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930				
November				
October				
September	46	117,185	119	337,091
August	37	82,429	97	277,077
July	40	93,999	83	249,064
June	28	60,622	63	171,223
May	35	59,807	82	240,137
April	26	39,332	66	183,706
March, 1930	24	31,987	82	235,656

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	227	654,598	184	596,347
November	219	618,855	206	616,266
October	236	680,430	217	628,733
September	255	697,262	218	616,018
August, 1930	211	631,167	221	621,088
July	230	687,670	196	611,768
June	240	632,188	225	641,270
April	214	639,153	200	637,922
March, 1930	211	682,547	218	677,011

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	154	646,767	174	689,358
November	144	570,715	161	656,424
October	151	617,143	154	639,552
September	171	699,832	154	629,577
August	164	670,748	159	653,208
July	166	674,380	166	676,092
June	154	652,411	134	560,605
May	168	709,182	156	625,712
April	161	555,903	156	569,368
March, 1930	179	710,763	150	631,782

Houston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1930	35	143,585	47	185,757
November	28	105,541	50	178,538
October	34	136,215	50	182,729
September	32	140,415	62	220,024
August	39	147,462	69	257,365
July	30	120,727	42	158,570
June	47	190,145	45	193,620
May	41	146,840	47	172,171
April	38	139,147	57	206,182
March, 1930	33	130,108	43	162,519

Note: The figures given in this table are for direct entrances and clearances. Additional vessels in foreign trade enter and clear from and to other American ports after original entry and before final departure. At the port of Philadelphia, for instance, additional vessels in the foreign trade in this category were 74 of 256,075 net tons entered and 74 of 253,213 net tons cleared for the month of December.

Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Shipping Board Loans Made, Authorized or Pending

ACCORDING to figures compiled by the National Council of American Shipbuilders on Jan. 1 of this year there were 26,000 men employed in construction and ship repair work in 20 coastal shipyards as compared with 22,000 on Jan. 1, 1930. The value of unfinished work on hand Jan. 1, 1931, amounted to $65,000,000 for privately owned vessels and $25,000,000 for government vessels. On Jan. 1, 1930 the value of all unfinished work on hand at these yards was approximately $90,000,000 for privately owned vessels and $30,000,000 for government vessels. Particular emphasis is laid by the national council upon the fact that not a single vessel of a strictly cargo type is under construction, the present work being devoted to 18 merchant liners of combination passenger and cargo type, eight tankers and two large yachts aggregating 308,800 gross tons. Also under construction are six government vessels with a total displacement of 47,800 tons consisting of three scout cruisers, one airplane carrier and two coast guard cutters.. It is pointed out that although the shipbuilding industry, largely as a result of the Jones-White act is doing exceptionally well as compared with the years prior to 1930, still, as a whole, it is operating at about 50 per cent of normal capacity. The total number of building ways now available in this country for the construction of sea going vessels, is 82, 62 of which are in Atlantic coast yards and 20 on the Pacific coast. If all the building ways were occupied the estimated employment in shipyards would be 41,000 workers.

Value of Work Increases

According to a preliminary tabulation of data collected in the census of manufactures taken in 1930 by the bureau of the census, Washington, D. C., establishments in the United States engaged primarily in ship and boat building and repairing work done during 1929 did work in value of $214,312,944, an increase of 11 per cent compared with $193,028,517 reported for 1927 the last preceding census year. This figure does not include the total value of completed vessels (except those on which construction was begun and finished within the census year), but only the value of the work done during the year. These figures apply only to private yards since no data were collected from ship and boat building plants operated by the government. Included in the total for the value of work done in 1929 on vessels launched within that year are the following: Ships of five gross tons and over, steel, $45,205,106; wooden $15,123,225; boats of less than five gross tons $13,150,908. The value of work done in 1929 on vessels under construction but not launched was: Steel vessels $21,497,493; on wooden vessels $3,212,060. The total amount received for repair work $116,124,152 is 51.2 per cent of the total value of all work. Of the vessels launched, 451 with a gross tonnage of 268,558 were steel of five gross tons and over; 1053 with a gross tonnage of 226,248 were wooden of five gross tons and over; and 28,967 were boats of less than five gross tons.

Naval Bill Goes to Senate

On Jan. 19 the senate committee on naval affairs ordered a favorable report on the naval construction bill which carries authorizations of more than $80,000,000 for new construction. The bill was introduced by Senator Frederick Hale of Maine. The bill provides for one aircraft carrier to cost not over $27,650,000; one flyer cruiser to cost not over $20,780,000 including armor, armament, ammunition, and airplanes; one six-inch gun cruiser to cost, including armor, armament, ammunition and airplanes, not to exceed $16,605,000; four submarines to cost in all $17,600,000; and 130 additional useful airplanes to cost not over $5,000,000. The proposed 1932 program of reconstruction, prepared by naval experts and now in the hands of the senate naval committee, totals $139,935,000. The 1932 program includes the vessels and airplanes authorized in the bill reported Jan. 19 and also ten destroyers and one destroyer leader. These vessels have been authorized but have never been appropriated for. The total cost of them would be $52,300,000.

Award Coast Guard Contract

The Bath Iron Works Corp., Bath, Me., on Jan. 9 was awarded the contract for the construction of seven 165-foot patrol boats at a cost of $195,000 per boat or a total of $1,365,000 for the seven. The bids for the construction of these boats was opened Jan. 5, 1931. The Bath Iron Works Corp. bid was the lowest of 13.

These vessels are to be 165 feet long overall, 25 feet 3 inches molded beam, displacement about 300 tons, to be powered with Winton diesel engines with a total shaft horsepower of 1300 driving twin screw propellers. Other companies and their bids for each of the seven boats per boat were as follows: Defoe Boat & Motor Works, Bay City, Mich., $201,800; United States navy yard, Philadelphia, $208,000; Marietta Mfg. Co., Point Pleasant, W. Va., $213,000; The Maryland Dry Dock Co., Baltimore, $214,275; The United States Navy Yard, Portsmouth, N. H., $214,823 to $232,000 depending on the engines installed; General Engineering & Dry Dock Co., Oakland, Calif., $245,425; the Pusey & Jones Corp., Wilmington, Del., $246,500; the United Dry Docks, Inc., New York, $262,000 to $269,500 depending on engines installed; Bethlehem Shipbuilding Corp., Ltd., San Francisco, $264,900; The Sun Shipbuilding & Dry Dock Co., Chester, Pa., $269,000; the Todd Dry Dock Engineering & Repair Corp., $306,000; the Consolidated Shipbuilding Corp., New York City $335,341.

The first boat shall be completed and delivered not more than 300 days after date of receipt of notice to proceed. Subsequent boats shall be completed and delivered at intervals of not more than 25 days.

Plan New Light Vessels

Plans are being made by the lighthouse service of the department of commerce to launch a building program which is expected to involve more than $2,000,000 in the next 12 months. This building program includes the construction of new vessels, lighthouses and enlarging a number of lighthouse depots. A great deal of the work is already under way and a number of contracts are still pending. The keel of one new lighthouse tender was laid down a few weeks ago and bids for the construction of three other vessels of this same class have been invited. Plans are also being made for two more tenders and a coal barge. Two lighthouse tenders and two lightships are to be reconditioned bringing the total cost of marine engineering work to about $1,125,000. It is the purpose of the lighthouse service to begin work on these different projects at once in order to help relieve unemployment.

Order Is Placed for Giant French Passenger Ship

Orders have been placed for the construction of a new giant trans-Atlantic passenger liner to succeed the ILE DE FRANCE as flagship of the French line's fleet, according to an announcement made Jan. 16 by Jean Tillier, general manager of the line for the United States and Canada. The order was placed with the Penhoet Shipyard in St. Nazaire.

The new ship will have a length of almost 1100 feet and a speed of over 30 knots. The cost of the ship has been estimated at from $27,500,000 to $30,000,000. The keel of the giant liner will be laid next month and it is expected that she will enter service between Havre and New York in the spring of 1934.

The propelling equipment will be turbine electric. She will have quadruple screws, four groups of turbo generators and 30 water tube high pressure, super heated steam boilers of the improved Penhoet type. The motors have been ordered from the firm of Alsthom, of Belfort. It is believed that the new ship will be capable of developing approximately 150,000 horsepower in order to maintain a speed in excess of 30 knots.

This new liner which will accommodate 3000 passengers and crew will be the largest and one of the fastest in the world.

Building and Repair Work

The Sun Shipbuilding & Dry Dock Co. at Chester, Pa. has under construction four large tankers and is employing a total of 3400 ship workers.

The NORTHERN SUN, being constructed for the Motor Tankship Corp., is scheduled for launching on Jan. 31 with Miss Josephine S. Eckert, daughter of the vice president of the Sun Oil Co., acting as sponsor. Two other tankers of the same size are being built for the same corporation and are scheduled for delivery in March and May.

This yard also has under construction a 200-foot tanker which is to be all-welded.

The tanker DAYLIGHT building at the Chester yard for the Standard Transportation Co., shipping subsidiary of the Standard Oil Co. of New York, is approximately 40 per cent complete. It is expected that this vessel will be ready for delivery in May. This craft is of 13,450 tons similar to those being built for the Motor Tankship Corp. When completed, this vessel will round out the shipbuilding program of the Standard Transportation Co., two other tankers having already been delivered. This yard has been doing considerable repair work on many types of vessels and the two floating drydocks at the yards have been exceptionally busy.

To Develop the Diesel

The committee which ordered the Hale naval bill reported to the senate Jan. 19 added an amendment authorizing the expenditure of $3,000,000 to promote development of the diesel engine.

Adds Tugs to Service

The Erie railroad has added four diesel electric tugs each with engines of 1000 horsepower to its marine equipment in New York harbor. This makes a fleet total of 295 units including tugs, ferryboats lighters, barges and car floats. These new tugs are named the CLEVELAND, the OLEAN, the ROCHESTER and the SCRANTON. They are to be used in handling heavy floats between the various interchange points and the Jersey terminals.

These tugs are 108 feet long, 26 feet beam and 13 feet depth. Each vessel is driven by two six cylinder Ingersoll Rand vertical four cycle 15-inch bore, 20-inch stroke, oil engines which develop 500 horsepower each at 265 revolutions per minute. Each engine is direct connected to a 330-kilowatt, 250-volt General Electric generator supplying electric current to a motor which is direct connected to the propellor.

Construction Going Ahead on New Grace Liners

Shown in the accompanying illustration is an artist's drawing of one of the four 19-knot passenger and cargo liners which are to be built by the Federal Shipbuilding & Dry Dock Co. at Kearny, N. J. for the Grace line. These vessels were designed by Cox & Gibbs and will cost $4,250,000 each.

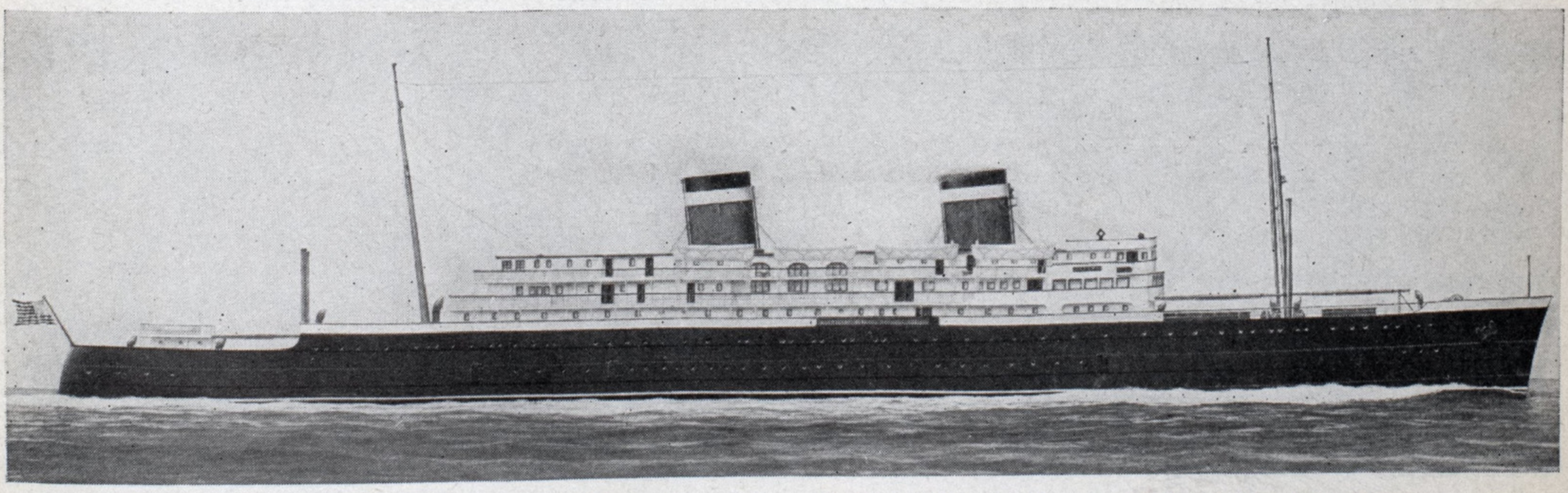
These new vessels will have a length of 508 feet, a beam of 70 feet and a displacement of 15,600 tons. They will have geared turbine drive and will be built to maintain a speed of 19 knots with reserve power to increase this speed if occasion arises. They will have nine transverse bulkheads and will be of the two-compartment type. They will have accommodations for 222 first and 70 tourist class passengers. They will have space for 7000 tons of cargo and will have refrigerator facilities for carrying perishable and semi-perishable products.

These new liners will be built in excess of the requirements of the London Conference for the Safety of Life at Sea and the United States regulations.

United Drydocks Inc. has under construction a new ferryboat for New York City and a 250-foot cutter for the coast guard.

Building Three Vessels

A summary of the construction work at the Tebo plant of the Todd Shipyards Corp. at the present time shows that three vessels are being built at this yard. These include two municipal ferryboats and one municipal fireboat. The ferryboats are each to be 151 feet long overall, 35 feet beam and depth 14 feet 3 inches. The fireboat is to be 130 feet long overall, 123 feet at the water line, 26 feet beam with a draft of 7 feet 7 inches. This vessel will have a speed of 18 miles an hour and will be capable of pumping 16,000 gallons of water a minute.



Artist's Drawing of One of the Four Passenger and Cargo Liners Building for the Panama Pacific Line (Grace)

Mammoth New Cunard Liner Building at John Brown's

Work is going forward on the mammoth new Cunard liner at the yard of John Brown & Co., Ltd., Clydebank with whom the contract was placed last month. An artist's drawing of this vessel is shown in the illustration at the bottom of this page. The principal dimensions of this vessel indicate that she will be one of the largest in the world being exceeded in size only by the proposed super liner of the French lines. She will have a length of 1018 feet, a tonnage of 73,000 and a capacity of 7300 cubic feet. Her propelling machinery will consist of quadruple screws driven by four sets of Parsons turbines with single reduction gearing and steam supplied by oil fired boilers of Yarrow design.

As a result of the construction of this new vessel 3000 shipyard workers in Clydebank will be provided with employment during the next three years, together with thousands of workmen in numerous other trades which will be occupied in furnishing and fitting out the vessel.

When this giant Cunarder is completed it is expected that the result of many years research work and experiment among naval architects and marine engineers will be evident.

Stabilizer Ordered for New Italian Destroyer

An order from the Sperry Gyroscope Co. of New York, for the manufacture of a gyroscopic stabilizer and electric control equipment specified by the Italian ministry of marine for an Italian warship, is announced by the Westinghouse Electric & Mfg. Co.

The stabilizer is to be installed in the new 2000-ton destroyer leader PIGAFETTA, now building at Spezia, Italy. The gyroscopic wheel of the machine will weigh 33,000 pounds, is seven and a half feet in diameter and with its case and complete equipment will weigh 40 tons. When running at 1350 revolutions per minute, the stabilizer will hold the vessel to within two or three degrees maximum roll in the severest weather which may be met.

Use of the device, naval experts point out, will afford a steadier deck platform for gun training, range finding and better steering qualities in a seaway, so essential in a light, high speed warship. In addition, the elimination of the roll will reduce the fatigue which a person consciously or subconsciously suffers on a vessel in a seaway, thus keeping the personnel at a higher pitch of physical and mental alertness.

Submit Plans for Cruiser

According to the department of the navy, specifications for the seventh and last 10,000-ton 8-inch gun cruiser which may be laid down by the United States under terms of the London naval treaty prior to 1933 have been issued to private contractors. Bids for the construction of this vessel are to be opened Feb. 11. This cruiser is the seventh authorized under the 1929 building program and will be the third constructed in a private shipyard. This new vessel which is designated as Light Cruiser 37 will be a sister ship of the New Orleans class. The limit of cost for this cruiser is $17,000,000.

Mexico May Buy Vessels

The proposition of purchasing from American manufacturers a fleet of swift 1200-ton electrically driven speed boats for scout work along the Mexican coasts, is being considered by the ministry of war and marine of Mexico. The craft will be similar to those operated in similar service by Canada and Norway. It is proposed to arm the scouts with two 0.75 guns each, and to use them to run down contrabandists and harrass rebels if need be. One of the objects of these fast ships is to relieve naval vessels from work of minor importance. The ministry feels that the use of such craft is essential as smuggling from the United States and other countries is steadily on the increase. The scout craft would be used extensively along the coasts of the Gulf of Mexico state of Vera Cruz, and the western states.

Hold Successful Trial Run of New Motorship

On Monday Jan. 12, the PAN NORWAY ran successful trials at sea off the mouth of the River Tyne. She is an oiltank motorship built by Swan, Hunter, & Wigham Richardson, Wallsend-on-Tyne for Leif Hoegh, the manager of the Aktiesolskabet Arnstein.

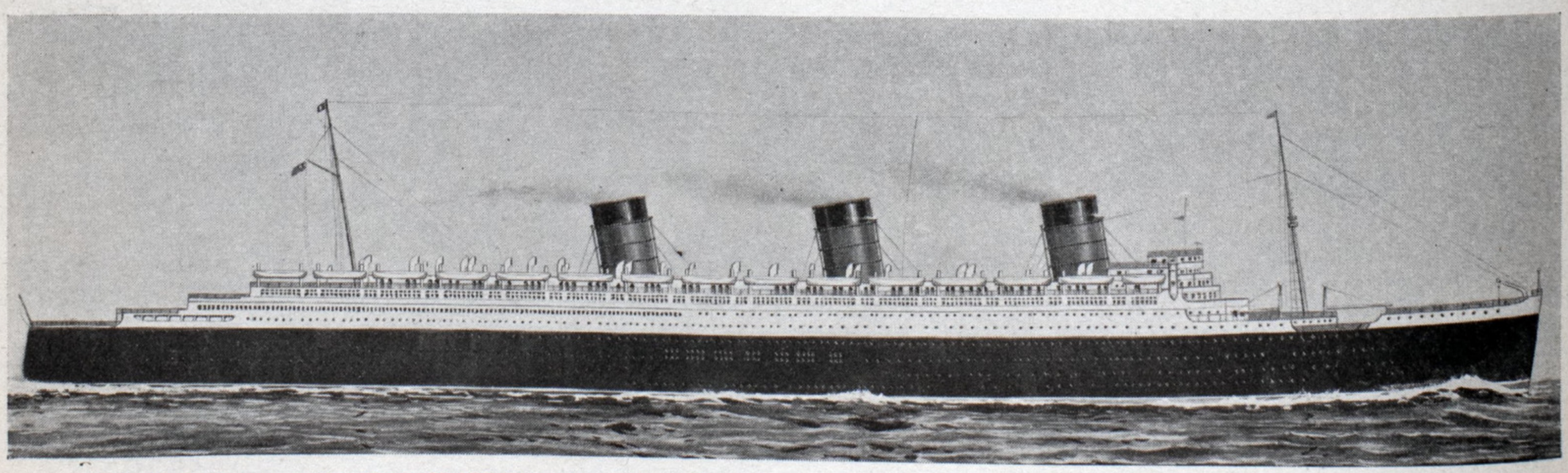
The PAN NORWAY has been built on the longitudinal system of framing and carries the highest class of Lloyds Register. She carries oil in bulk and her deadweight capacity is about 13,500 tons. Her chief dimensions are a length between perpendiculars of 483 feet, a breadth of 65 feet 6 inches and a molded depth of 36 feet 9 inches.

There are ten main oil holds each divided by a longitudinal bulkhead. In the tween decks are expansion trunks with auxiliary summer tanks at the sides. The pumping chamber is placed amidships and the lines of piping are all duplicated in order to facilitate rapid loading and discharging.

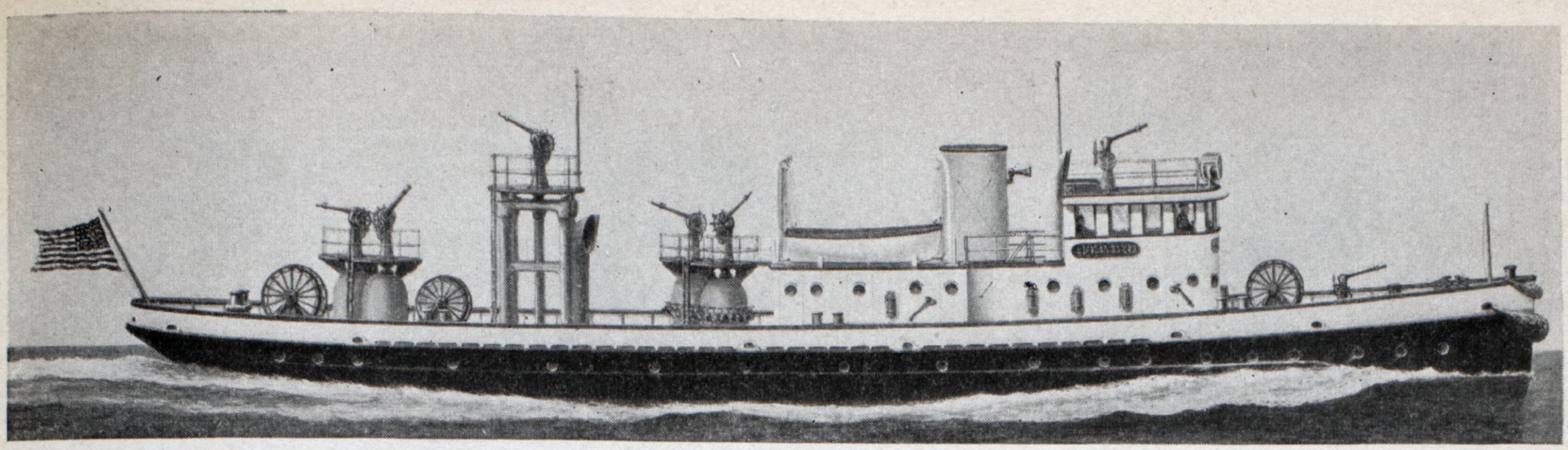
The main propelling machinery is placed at the after end of the ship and has been supplied by the Wallsend Slipway & Engineering Co. of Wallsend-on-Tyne. There is a single-screw, six-cylinder, two-stroke cycle oil engine of the Wallsend-Sulzer type. To provide steam to the engine room auxiliaries and deck machinery, the Wallsend Slipway Co. have built two single-ended oil-fired boilers through one of which the exhaust gases of the engines pass.

Tender Contract Awarded

The Leathem D. Smith Dock Co., Sturgeon Bay, Wis., has been awarded the contract for building a new tender for the bureau of lighthouses, Great Lakes division, at $88,900. It will be of steel construction, 86 feet long, with a 22-foot beam, and is to be delivered by the end of August this year. The new tender will be named the CHERRY.



Artist's Picture of the New 75,000-Ton Cunarder Now Under Construction at John Brown & Co. Ltd., Clydebank



Artist's Drawing of New 130-Foot Flame-Proof Fireboat for New York City to Cost $582,500

Contract for New Fireboat for New York Awarded

A contract for the construction of a new flame-proof fireboat, capable of throwing 16,000 gallons of water per minute, was awarded to the Todd Shipbuilding & Drydock Co. of Brooklyn by Fire Chief John J. Dorman, it was announced by Joseph A. MacDonald, president of Henry J. Gielow, Inc., naval architects selected to design and supervise its building.

The new marine fire fighter will be 130 feet long, will have a beam of 26 feet, a draft of 7 feet 6 inches and will be powered by five main gasoline engines, developing a total of 2740 horsepower. The engines will furnish current for two electric motors of 1165 horsepower which will drive the craft at 18 miles per hour.

Placing of the contract at this time, Mr. MacDonald stated, will necessitate the expenditure of $582,500 and will furnish direct and indirect employment to 2000 men until the middle of next summer.

According to the architect's plan, the water will be drawn through two intakes on either side of the fireboat by means of four centrifugal pumps which will discharge 64 tons per minute through any or all of 20 nozzles on the craft. In addition, the boat will carry 4000 pounds of fire foam, a chemical preparation used for combatting oil and gasoline fires.

Fuel consumption of the engine is estimated at 50 gallons per hour per engine or a total of 250 gallons per hour for the battery of five power units. The gasoline will be carried in two 3025-gallon tanks, one forward and one aft. The tanks will be of a non-explosive type, protected by an aqua system with no air space above the gasoline level. In addition, the tanks will have baffle plates to resist or check the swashing of the fuel and the containers will be guarded by encasements, which, in turn, will be protected by a carbon dioxide fire-fighting system.

One auxiliary power boat, equipped with a fire pump of 150 gallons capacity for use in combatting fire under piers and wharves will be carried aboard the craft.

The boat will be equipped with wireless telephone and telegraph, and a receiving and sending set to keep in constant communication with the municipal broadcasting station,

Work at Camden Yard

In spite of the fact that the keel of the first of the 33,000-ton liners building at the Camden plant of the New York Shipbuilding Co. for the United States lines was laid only a month ago, hundreds of tons of steel are already in place along the hull of the 705-footer. Within a short time, the keel of the second vessel is to be laid.

The cruiser INDIANAPOLIS which is limited by treaty to 10,500 tons is approximately 50 per cent completed at the same yard.

The two vessels for the American Export Line, the EXETER and EXCAMBION are also under construction by the same yard and are over 50 per cent complete.

To Be Converted to Dredge

Sale of the steamship BROOKLINE to the O'Brien Brothers Dredging Corp., New York, for the sum of $12,500 with the understanding that the vessel be converted into a self-propelled gravel dredge at a cost of not less than $150,000 was authorized by the shipping board Jan. 7. As a dredge, the vessel will be operated between Montauk Point and Execution Light, Long Island sound.

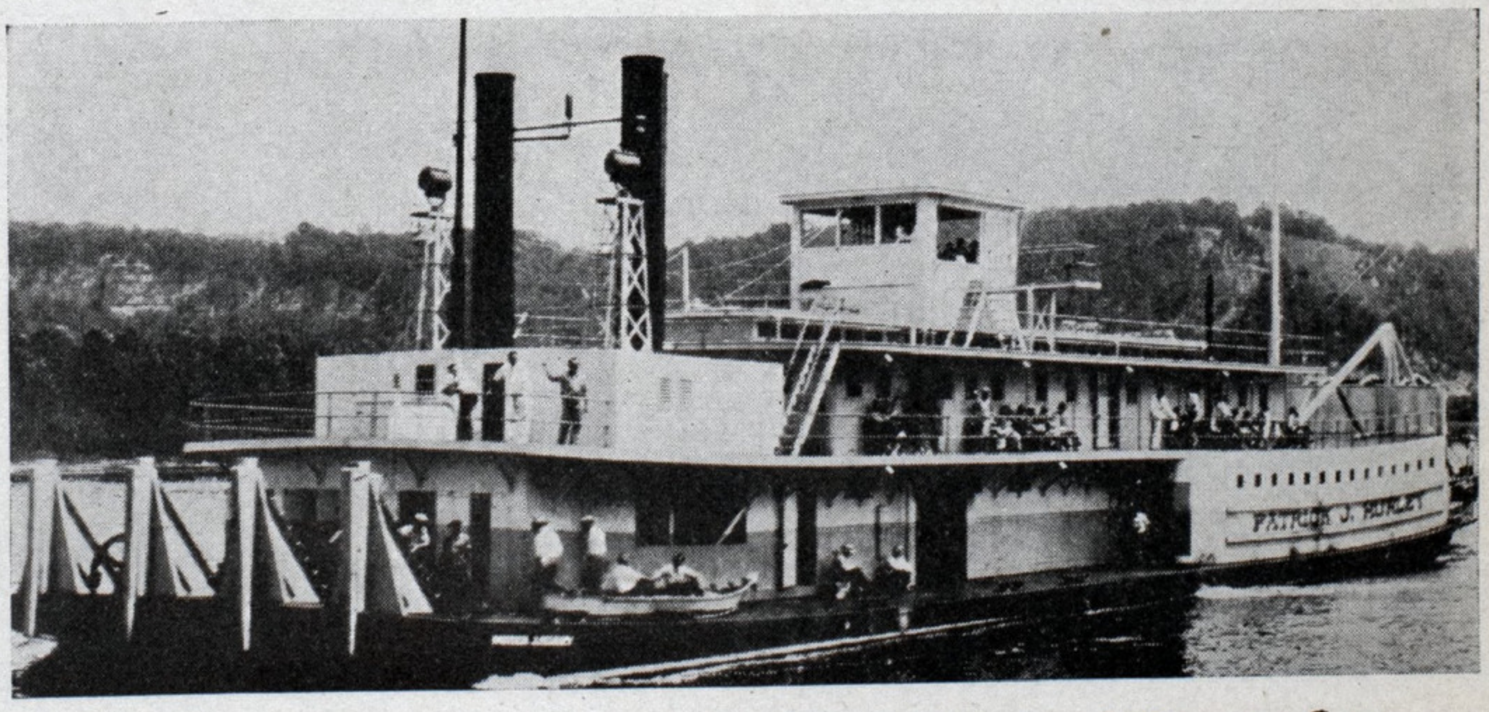
The BROOKLINE is a steel cargo vessel of 8550 deadweight tons, equipped with reciprocating engines and Foster boilers, and has been in lay-up since Sept., 1921. The ship has been grouped as one of the surplus vessels available on a dismantling and scrapping basis.

New River Towboat Enters Service on Mississippi

The stern wheel steel towboat PATRICK J. HURLEY, shown in the accompanying illustration, recently entered the service of the Inland Waterways Corp. on the Mississippi river and its tributaries.

The principal dimensions of this new towboat are: Length overall 196 feet, length on deck 160 feet, beam molded 42 feet and draft 4 feet. It is propelled by two tandem compound steam engines built by the Nordberg Mfg. Co. of Milwaukee. These engines develop 1000 horsepower. The engines derive steam from water tube boilers manufactured by the Foster Wheeler Corp. of New York City.

This modern towboat is subdivided by seven transverse bulkheads and two longitudinal wing bulkheads. Provision has been made for carrying fuel oil, fresh water, stores and a crew of from 19 to 21. It was designed jointly by the engineering department of the Inland Waterways Corp. together with Cox & Stevens, New York naval architects. The boat was built by the Dubuque Boat & Boiler Co.



Stern Wheel Steel Towboat, Patrick J. Hurley, Built for Inland Waterways Corp.

Self Trimming and Self Discharging Pulverized Coal Burning Bulk Cargo Vessel H. F. De Bardeleben

Converted Cargo Ship in Service on Gulf

The steamship H. F. DeBardeleben, shown in the accompanying illustration, recently entered service on the Gulf of Mexico under operation of the Bulk Transportation Corp., Div. of DeBardeleben Coal Corp. This vessel was formerly the shipping board steamer Bremerton remodeled and converted by Jahncke Dry Docks Inc. of New Orleans. The plans and specifications were by the late Edwin C. Bennett, New York naval architect and marine engineer. The total cost of conversion was $700,000. The H. F. DeBardeleben is a steel vessel 380 feet long, 53 feet beam, 23 feet six inches draft and of 7500 deadweight tons. The vessel is fitted with the Todd unit system of pulverized fuel burning. It is equipped with special self-discharging apparatus known as the Leathem Smith conveying and discharging system. The propelling machinery consists of a triple expansion steam engine which derives steam from three single ended Scotch boilers arranged for burning pulverized coal.

The vessel has five cargo holds and 12 hatches and is especially equipped for handling bulk commodities although there is sufficient space in the forecastle between decks to accommodate about 500 tons of package freight.

The H. F. DeBardeleben is the first American owned self trimming and self discharging vessel on the Atlantic, Gulf and Pacific seaboards, and the first pulverized coal burning vessel operating from Gulf ports. Her fuel consumption has improved about 18 per cent.

Geared Turbine on Tug

An advance in transportation machinery on the Great Lakes is marked in an order from the Great Lakes Dredge and Dock Co. of Chicago for a large tug boat propelled by a geared turbine drive to the Manitowoc Shipbuilding Corp., Manitowoc, Wis.

The turbine machinery, the first of this type to be installed in a Great Lakes vessel, will be manufactured by the Westinghouse Electric and Mfg. Co. and will use steam at the highest pressures ever tried in a vessel of this type. Innovations in rapid handling of the turbine and steering for rapid maneuvering will be among the progressive features incorporated in the tug, to be completed this summer.

Award Contracts for Barges

The Inland Waterways Corp., with the approval of the secretary of war, has accepted the bid of the Marietta Mfg. Co., Point Pleasant, W. Va., for five barges; the Midland Barge Co., Midland, Pa., for five barges; the Ingalls Mfg. Co., Birmingham, Ala., for five barges, and the Alabama Dry Dock Co., Mobile, Ala., for five barges at a price of $59,780 per barge.

It has accepted the offer of McClintic Marshall Co., Pittsburgh, for ten barges, and the American Bridge Co., Ambridge, Pa., for 10 barges, at a price of $67,560 per barge.

It is expected that 10,000 to 12,000 tons of steel will be required for the construction of light cruiser No. 37, on which the navy department will open bids in Washington, Feb. 11. The boat is to be built in a private yard.

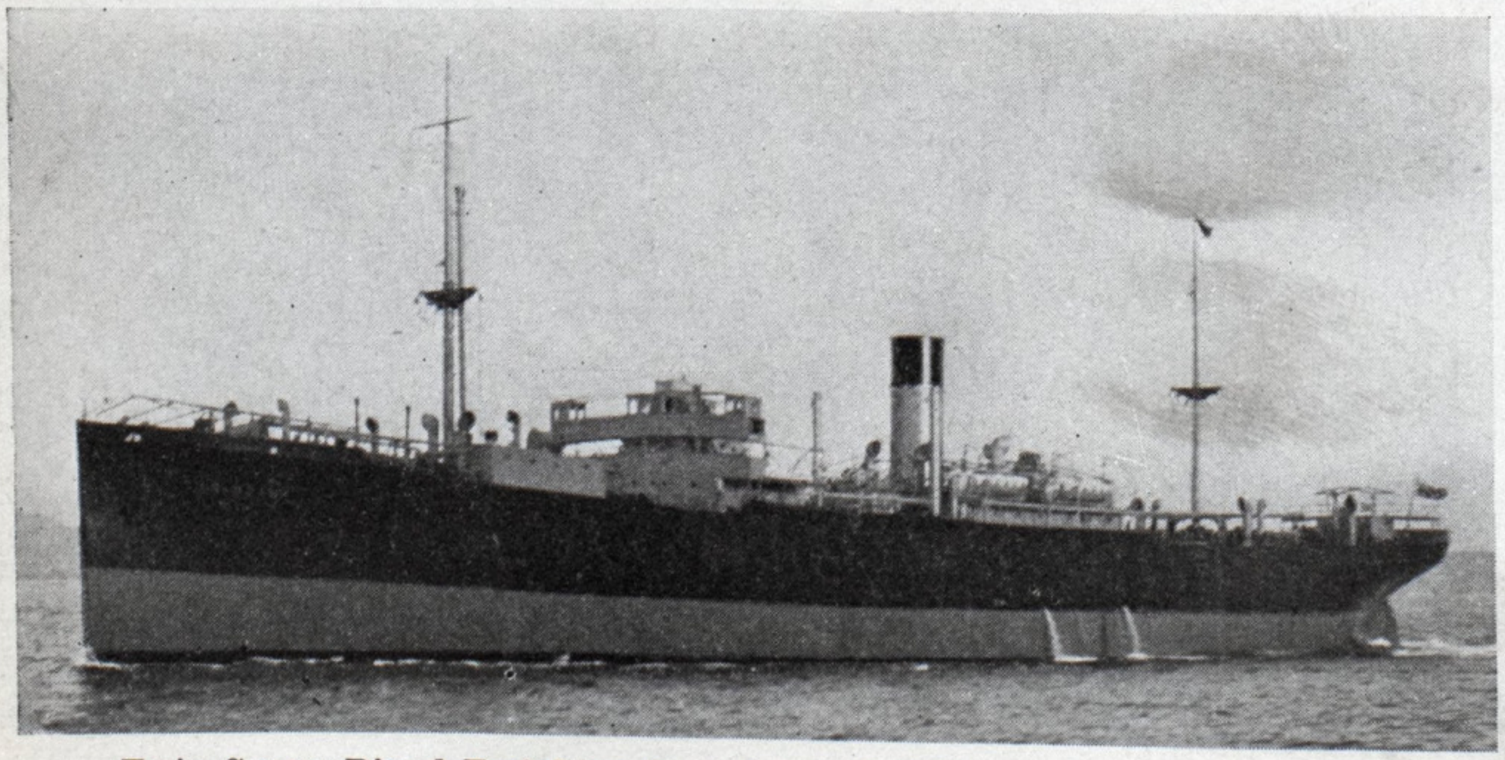
Twin Screw Diesel Vessel

The twin screw motor vessel Laganbank, built by Harland & Wolff Ltd., for Andrew Weir & Co., recently left Belfast for her official trial trip.

This vessel is a high class motor cargo type. Her principal dimensions are: Length, 425 feet; breadth, 57 feet; depth, 38 feet 7 inches; gross tonnage, 5680. Built to Lloyd's survey and board of trade rules she is well equipped for the rapid handling of cargo, five large hatches being worked by ten steam winches. A special 22-ton derrick is fitted for dealing with heavy lifts.

Accommodation for the officers and engineers is very comfortably furnished and the rooms are heated and ventilated electrically.

The propelling machinery consists of two sets of Harland-B. & W. two-cylinder motors with airless injection. Three auxiliary engines of the same make each coupled to a 65 kilowatt generating set, supply the electric current required for lighting and power on board the ship. A steam driven generator is also fitted. A single-ended scotch boiler supplies steam for ship's use, and an auxiliary condenser with a combined air and circulating pump is provided.



Twin Screw Diesel Freighter Laganbank Built by Harland & Wolff Ltd.

Order Special Type Barge on Pacific Coast

The problem of freighting logs over long distances at sea is believed to have been solved by Seattle, Wash. builders and designers who are now constructing the first steel barge planned for carrying huge loads of logs on deck. Log towing in the open sea has been in vogue for years on the Pacific but it is always attended by high percentage of loss as it is impossible to handle tows with safety except in the most favorable weather. All modern methods for securing logs in a raft have been found unworkable in heavy weather.

The barge under construction is a special type designed by W. C. Nickum, Seattle naval architect and engineer. It is 160 feet long, 50 feet beam, depth 15 feet and load draft 11 feet. There are eight watertight compartments in which oil can be carried if required. The deck is sloping, covered with a 5-inch wood deck. The arrangement includes a system of draining the deck of seas that wash over. The method of stowing is known as the herringbone method so that logs are held securely on deck and can be easily discharged. A 40-ton locomotive crane will be used to load and discharge. It is stated that only three men will be required aboard. The crew's quarters will be aft.

The plans call for light deck lashings for the deck load which can be easily released in the event of such heavy weather that the safety of the craft is involved. The barge's capacity will be about 550,000 feet of logs, equal to two ordinary rafts. The Marine Construction Co., Seattle, has the contract to build the craft which will require between 400 and 450 tons of shapes and plates. Local capitalists are furnishing the capital for building the barge having signed a long time contract with a lumber firm at Grays Harbor who transport logs from the Oregon coast to Grays Harbor.

The new craft has been approved by the San Francisco board of marine underwriters and the American Bureau of Shipping. By using the barge the logging operators will have greatly reduced insurance while the cost of freighting will also be materially less.

The design of the barge calls for a bow which will tow easily. Power will be furnished by the tug TYEE, owned by the Hubble Towing Co., of Aberdeen, Wash. The TYEE is equipped with a 500-horsepower Atlas Imperial diesel engine and is expected to tow the barge with a full cargo at 6 to 6½ knots an hour compared to 2-2½ knots made with log rafts in the open ocean.

Bids Low on Diesel Tugs

The Marine Iron & Shipbuilding Co., Duluth, Minn., was lowest among 12 bidders for building four 65-foot 6-inch diesel powered tugs for the United States engineers office at Milwaukee at a price of $170,760. The Pierce McLouth Co., Marine City, Mich., is second low at $193,000. Bids were opened Jan. 16 and have been referred to the headquarters at Washington, for approval and confirmation. Two of the tugs will be stationed at Milwaukee, one at Duluth and another at Buffalo.

Receives Contract for Tug

The Pusey & Jones Corp., Wilmington, Del. Recently received a contract from the Chesapeake & Ohio railroad for the construction of a single screw steam operated steel tugboat. This vessel is to be 109 feet long, 28 feet beam and 14½ feet depth. The Pusey & Jones yard also has under construction five other tugs and a 169-foot yacht.

Sixth Cruiser Completed

The LOUISVILLE, the navy's sixth 8-inch gun cruiser built at the Puget Sound navy yard was placed in commission Jan. 15. Capt. Edward J. Marquart was placed in command. The commissioning of the LOUISVILLE marked the entry into naval service of the sixth of eight 8-inch gun cruisers authorized by Congress in 1924. The two remaining cruisers in the 1924 program are the U. S. S. AUGUSTA building at the Newport News Shipbuilding & Dry Dock Co. and U. S. S. CHICAGO building at the Mare Island Navy yard.

Reconstructed Vessels to Run in New Service

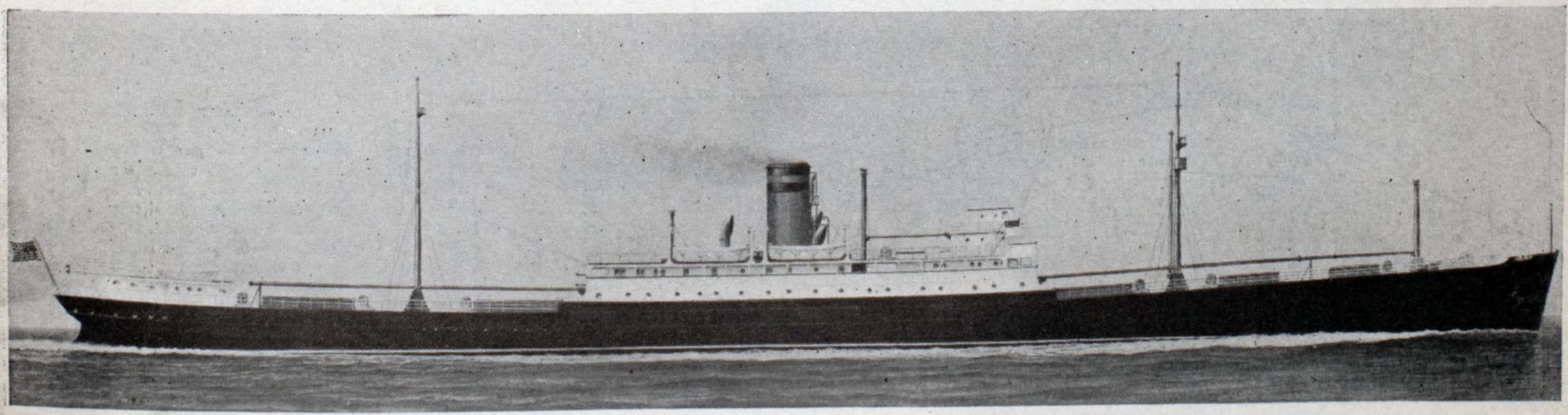
The Baltimore Mail Steamship Co. which adds to the transatlantic service another line flying the United States flag will inaugurate its passenger, fast freight and mail service between Baltimore and Hamburg with the sailing of the CITY OF BALTIMORE on July 2. This line will also stop at Hampton Roads ports at the mouth of Chesapeake Bay and it is expected to call at Havre and Bremen enroute to Hamburg. This company has under reconstruction at the yard of the Federal Shipbuilding & Drydock Co. at Kearny, N. J. five steel cargo steamers purchased from the shipping board for $150,000 cash for the five vessels.

The CITY OF BALTIMORE, which is to be the flagship of the fleet, was launched Dec. 18 at the Kearny yard. The four other vessels, the NORFOLK, the NEWPORT NEWS, the HAVRE and the HAMBURG are being reconstructed at the same plant and will be delivered at intervals of approximately one month commencing in June. The work of reconstruction on these vessels involves modification of hull lines and the installation of more powerful engines to increase their speed. They will be equipped with oil burning engines and will be capable of a sustained sea speed of 16 knots. The length of the vessels will be 506 feet with a beam of 56 feet and draft of 24 feet. Their displacement will be approximately 12,000 tons.

The Baltimore Mail Steamship Co. will maintain regular weekly sailings each way.

These five vessels are being reconstructed with the aid of a construction loan of $6,540,000 awarded by the shipping board July 11. They are to be operated under the terms of an ocean mail contract awarded the Roosevelt Stemship Co. in New York.

Plans were announced recently by the Duluth South Shore & Atlantic railway for the construction of a new dock in Marquette, Mich. to replace the one which has been in use for 25 years. The new dock will cost $1,800,000.



One of the Five Reconstructed Liners of the Baltimore Mail Steamship Co. as They Will Appear When Completed

Contract for River Boat Is Awarded on West Coast

Contract for construction of a 160-foot steel passenger and freight vessel of the tunnel propeller type has been awarded to the Albina Marine Iron Works, Portland, Oreg. Power will be furnished by either Atlas or Union engines. The vessel is designed for river traffic between Portland and Astoria, Oreg., and will be thoroughly modern particularly with respect to the handling of freight. Equipment will include a complete Colby system with Barlow elevators, furnishing not only dispatch but cheap operation. Electric lift trucks will pick up platforms loaded with freight and move them from dock to vessel. The Barlow elevator to be installed aboard will raise and lower trucks to accommodate any dock level.

The owners of the new vessel, which is to be named L. P. HOSFORD, are the Harkins Transportation Co., organized by Mr. Hosford. The L. P. HOSFORD is expected to develop 14 knots and to replace two stern wheel steamers now on the route. She will be ready for service about June 1. Other dimensions of the craft are: Beam 30 feet and depth 10.5 feet.

Four New Type Diesels

During the past year, four new types of diesel engines for marine use were produced abroad. The first of these is a four cycle single acting unit with continuous pressure charging. This engine is based on adaptation of the desirable features of two makes of single acting engines, combined with arrangements by which full use may be made of continuous pressure charging to increase the power output per cylinder without increasing the size or weight of the engine. The engine was designed for Alfred Holt & Co. Ltd. The second is a new two cycle single acting airless injection engine developed by Scotts Shipbuilding & Engineering Co. Ltd. This type has six cylinders of 27-inch diameter and 45-inch stroke and is rated at 2400 brake horsepower at 104 revolutions per minute, normal service and a maximum of 3000 brake horsepower at 112 revolutions per minute. The third of the new engines is an M. A. N. of six cylinders and rated at 3750 brake horsepower at 130 revolutions per minute. Camshaft operation of fuel valves and push rods is eliminated. The fuel valves have open nozzles without any moving members. The fourth of the new engines is a four cylinder of 2200 horsepower, built by Earle's Shipbuilding & Engineering Co. The cylinders are 24-inch diameter by 40-inch stroke. This is an air injection motor and is noteworthy for the design of the cylinders. These consist of two dome shaped working portions with common central block between this block containing exhaust and scavenging air ports.

Exhaust Turbine Data

The steamer LENA LUCKENBACH of the Luckenbach Steamship Co., Inc., which vessel was fitted with an American Bauer-Wach exhaust turbine, has now, with entire satisfaction to the owners, run for over a year with the new equipment, and the records of two years' performance, before and after conversion respectively, are now available for comparison.

About one knot in speed has been gained, which works out as a saving of three and one-half days for a round trip, and as practically six round trips are made per year, totaling approximately 60,000 miles, 20 sea days are saved, leaving more time in port for loading and unloading cargo and in reducing or eliminating over-time work. There is also an annual saving of 5400 barrels of fuel oil.

The vessel was built in Japan in 1920, is of 10,600 deadweight tons, and was originally equipped with three Scotch boilers and a triple expansion engine having 27½ x 45 x 75 inch cylinders and 51-inch stroke, and giving 2800 indicated horsepower and 10½ knots speed. By the installation of a contra-propeller and other improvements, this was subsequently, but prior to the installation of the exhaust turbine, brought up to about 11½ knots at 74 revolutions per minute.

Plan Turbine Drive Ships for Barge Canal Operation

Representatives of the Ford Motor Co. propose to operate in the barge canal a fleet of steamships larger than any craft ever seen in that waterway. Two of them may be well underway when the canal reopens in the spring.

The ships would be 300 feet long, 15 feet longer than the largest craft used in the waterway last season, with a 43-foot beam. The motive power would be furnished by 1600-horsepower geared turbines. Entering the canal at Oswego after cruising through the Great Lakes, they would proceed to tidewater on the Hudson River.

Lately engineers of the marine department of the Ford company inspected the canal lock chamber and the lift lock at Little Falls, the shortest chamber and the highest lift lock in the entire barge canal system, according to official state records. It is reported that the contract for constructing two of these vessels has been awarded the Great Lakes Engineering Works.

Award Engine Contract

King County has awarded to the Washington Iron Works, Seattle, the contract for a 560 brake horsepower Washington diesel, eight cylinder engine of the latest type on a bid of $52,695. The plant will be installed in the county's Lake Washington ferry boat LESCHI which is to be rebuilt in addition to having the new motive power installed. The Lake Washington shipyards have the remodeling contract on bid of $37,850.

Power on 40 Ships

The work completed by Burmeister & Wain Ltd., Copenhagen, during 1930 included the fitting of 40 ships with combined horsepower for main engines of 186,895 indicated horsepower and for auxiliary engines of 26,175 indicated horsepower giving a total output for 1930 of 213,070 indicated horsepower.

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
Jan. 18,1931	4.85@5.25	1.10	4.55½
Dec. 18	4.85@5.25	1.10	4.55½
Nov. 18	4.85@5.25	1.10	4.92
Oct. 18	4.85@5.25	1.10	4.92
Sept. 18	4.85@5.25	1.10	4.92
Aug. 18	4.85@5.25	1.20	4.92
July 18	4.75@5.00	1.20	4.92
June 18	5.00@5.25	1.15	4.92
May 18	5.00@5.25	1.15	4.76
April 18	5.00@5.25	1.20	4.92
Mar.18,1930	5.00@5.25	1.10	4.92

At Philadelphia

	Coal trim in bunk per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
Jan. 18, 1931	4.85@5.25	.85	4.88
Dec. 18	4.85@5.25	.95	4.88
Nov. 18	4.85@5.25	1.00	4.88
Oct. 18	4.85@5.25	1.05	4.88
Sept. 18	4.85@5.25	1.05	4.88
Aug. 18	4.85@5.25	1.05	4.88
July 18	4.75@4.50	1.10	4.88
June 18	5.00@5.25	1.20	4.88
May 18	5.00@5.25	1.20	4.88
April 18	5.00@5.25	1.20	4.88
Mar.18,1930	5.00@5.25	1.10	4.88

Other Ports

Boston, coal, per ton	$7.57
Boston, oil, f. a. s., per barrel	1.11
Hampton Roads, coal, per ton, f.o.b., piers	$4.35 to 4.50
Jan. 8—Cardiff, coal, per ton	13s 9d
London, coal, per ton	—s -d
Antwerp, coal, per ton	19s 9d
Antwerp, Fuel oil, per ton	67s 6d
Antwerp, Diesel oil, per ton	82s 6d
British ports, Fuel oil	67s 6d
British ports, Diesel oil	82s 6d

Will Develop Use of Alloy Steels in Marine Field

WHEN the Marine Steel Corp. was organized recently by Clifford D. Mallory and associates with headquarters in the Chrysler building, New York, to develop the use of corrosion-resistant alloy steels in marine applications, Lewis B. Lindemuth, one of the best known metallurgists in the steel industry, was made vice-president and general manager of the new company. As a steel expert familiar with the diversified and specialized requirements of the marine field, Mr. Lindemuth is well qualified to fill this position and has been placed in direct charge of the company's study of marine requirements.

L. B. Lindemuth

His career has been one of noteworthy contributions to the progress of the steel industry here and abroad. It also has been a colorful one, not only by reason of his travels in various parts of the world, but because of his disposition to make his own observation on the behavior of steel in exacting applications. For several years, for instance, he has been a department of commerce licensed airplane pilot, flying simply as a diversion and as a means of keeping in touch with the metal requirements of this new industry.

In 1928 while in Australia, he purchased a 40-foot ketch and with an Australian for a companion sailed for a 3000-mile cruise over the Pacific ocean, visiting various South Sea Islands. The cruise included a visit to the nickel and chromium producing regions of New Caledonia and ended in Suva, Fiji.

Born in 1887, in Wichita, Kansas, Mr. Lindemuth graduated from Penn State college in 1909 with a degree of bachelor of science in metallurgy, and entered the open hearth and bessemer department of the Pennsylvania Steel Co. at Steelton, Pa., at the same time continuing post-graduate work at Penn State college. In 1912 he received the master's degree in metallurgy from that institution. His initial efforts at Steelton were devoted to the development of iron ore from the company's Mayari deposits in Cuba. This ore, because of its nickel and chromium contents, offered great difficulty in the manufacture of steel. Mr. Lindemuth did much in developing the duplexing process, blowing in bessemer converters and subsequently refining in open-hearth furnaces, which enabled the Pennsylvania Steel Co. and its successor, the Bethlehem Steel Co., to use the Mayari ore in making high-grade steel for the automotive structural and other industries.

In 1913, he became assistant superintendent in the open-hearth and bessemer department of the Pennsylvania Steel Co. and in 1917 was transferred by the Bethlehem Steel Co. to its Saucon works at Bethlehem. He resigned this connection in 1918 and with Frank D. Carney, who at the same time resigned as chief metallurgist of the Bethlehem Steel Co., formed the firm of Carney & Lindemuth, New York, consulting engineers in connection with steel works operations in this country and abroad.

Death Claims Well Known Naval Architect

EDWIN C. BENNETT, technical secretary of the United States Load Line committee and chairman of the technical committee on the American Steamship Owners' association, died at his home in Leonia, N. J. on Dec. 31 at the age of 56. Mr. Bennett was well known in marine circles and ranked high as a naval architect.

During late years he had been one of the leading advocates of the use of pulverized coal, having designed and supervised several installations. The recent conversion of the shipping board freighter BREMERTON into the self-unloading and self-trimming cargo carrier H. F. DEBARDELEBEN was effected under plans prepared by Mr. Bennett. At the time of his death he was engaged in the preparation of plans and specifications covering changes and improvements on several vessels for the Mississippi Shipping Co. Inc., New Orleans.

Mr. Bennett was born in London, England, Nov. 5, 1874 and was educated at Weston academy, Bath, King Edward VI school, Birmingham and Armstrong college, Newcastle.

His first American connection was as assistant chief draftsman for the New York Shipbuilding Co., Camden, N. J., from 1900 to 1903. In 1904 he acted as naval architect for Townsend & Downey, New York; from 1905 to 1917 as chief draftsman and later naval architect at the Fore River Shipbuilding Co., Quincy, Mass., and from 1917 to 1922 he was vice-president and general manager of the Newburgh Shipyards Inc., Newburgh.

Edwin C. Bennett

Officers Are Elected by Neptune Association

CAPT. E. F. MITCHELL, master of the steamer AMERICAN MERCHANT, was elected to serve a second term as president of the Neptune association at the recent annual meeting held at 105 Broad street, New York.

Captain Mitchell is well known to American seafarers. He started his career on the east coast but soon drifted out to the west coast where he entered the collier trade. He served in the Philippines and spent most of his time on the west coast until the beginning of the World war. He was a lieutenant-commander during the War and later became master of a ship in the round-the-world trade. After a few trips in this service, he joined the United States lines and has been with the fleet ever since.

Capt. E. F. Mitchell

Capt. George Williams of Galveston was elected first vice president and Commodore Herbert Hartley of Opelika, Ala., was elected second vice president. Five trustees were elected: Commodore H. A. Cunningham, a former president, and Capts. S. J. Reynard, L. A. French, J. J. Vander Clute, and C. L. Taucer. Captain John F. Milliken was elected secretary-treasurer for a two year term, all the other candidates being elected for a one year term.

Ballots were sent out three months ago and returns were received from all parts of the world. The Neptune association is an organization of licensed masters and deck officers established in 1910. Headquarters are at 105 Broad street, New York with branches in Boston, Galveston, New Orleans, and Mobile.

W. A. Thorpe has been appointed assistant to the manager of the federal and marine department of the General Electric Co., according to an announcement made by the manager of the department, D. W. Niven.

Announcement was made on Dec. 27 of the retirement of M. J. Lindsay, freight traffic manager of the Matson Navigation Co. for many years. Marshall F. Cropley, his assistant, was appointed successor effective Jan. 1. Mr. Lindsay had been associated with the Matson interest for 30 years.

Recognition for Bravery Merited by Captain

THE Lake Carriers' association, Cleveland, has filed a claim with the Carnegie Hero Fund commission on behalf of Capt. Charles Mohr, master of the steamer WILLIAM NELSON of the Valley Camp Steamship Co.'s fleet, Cleveland. Application for the congressional medal has also been made to the government by George A. Marr, secretary of the association.

Captain Mohr, who has figured in five rescues on the Great Lakes, saving 27 lives, performed an act of unusual heroism when the schooner OUR SON, the last of the old time sailing vessels on the Great Lakes, foundered on Lake Michigan on Sept. 26 last. A terrific storm was raging when he sighted the disabled schooner flying distress signals and although he feared for the safety of his own ship and had sent out a call for assistance, he made his way to the doomed schooner. Coast guards had vainly tried to reach the sinking vessel and Captain Mohr had to circle her three or four times, pouring oil on the sea, before he could come up alongside. The schooner sank a few minutes after her crew of seven men had been taken off. The carferry PERE MARQUETTE 22, which answered Captain Mohr's distress signal, arrived meanwhile and stood by but the crew of the OUR SON was rescued before the carferry could render any actual help.

Capt. Chas. Mohr

Other rescues in which he participated were as follows: seven persons were taken from a sinking launch on Georgian Bay on June 6, 1922; rescued three men from the yacht VALENCIA on Lake Erie on Nov. 12, 1926; rescued four men from the yacht MILDRED, of Erie, during a snow storm on Nov. 23, 1927, the yatch sinking shortly after; rescued six from an overturned motor boat on Lake Erie on July 25, 1929.

Captain Mohr is 53 years old and lives at 1510 Coutant avenue, Lakewood, O. He has been a Great Lakes captain for 22 years, commanding ships in the Valley Camp fleet for more than five years.

Bremen Makes Record Trip

A world's record passage from Bremen to New York was established on Jan. 20 when the North German Lloyd liner BREMEN docked at her Brooklyn pier, having made the passage in six days and three hours, thus beating by three hours the best crossing of her sistership, the EUROPA, from her home port. The crossing from Cherbourg breakwater, however, was four hours slower than the EUROPA's best time of four days, 17 hours and six minutes.

The ship left Bremen about six hours late at 5 p.m. on Jan. 14 and made the passage from that port to Cherbourg in the record time of 21½ hours, as against a normal time for the EUROPA or BREMEN of approximately 30 hours. The time of the world's fastest passage from Bremen includes five hours of delay at Southampton, Cherbourg and at quarantine.

Bulk Cargo Movement Shows Big Decrease

THE 1930 season registered the smallest total movement of bulk cargo on the Great Lakes since the year 1924, according to a report issued by the Lake Carriers association. Compared with the season of 1929, the decrease for this year amounted to over 25,000,000 net tons. It should be borne in mind, however, that the year 1929 established an all-time record for lake commerce. Generally depressed conditions in industry, resulting in drastic curtailment of the demand for Lake Superior iron ore, accounted for the greatest loss. The movement of ore for the past year was 28.56 per cent below that for the season of 1929. The wheat movement for 1930 stands as the lowest since 1920. Figures for the 1930 bulk cargo movement are given in the table below.

W. H. Landgrebe, chief hull draftsman of the American Ship Building Co., died suddenly of phlebitis on Jan. 16. Mr. Landgrebe had been associated with the American Ship Building Co. for over 30 years and was well known.

Made Supervising Engineer of M. A. Hanna Company

WILLIAM T. TURNER has been appointed supervising engineer of the M. A. Hanna Co. to succeed Douglas Brews, who retired recently. Mr. Turner was formerly superintendent of the New York Oil Storage & Transfer Co., Bayway, N. J., having joined the company in 1924.

Born in Scotland, he served his apprenticeship with Scott's Shipbuilding & Engineering Co., Greenock, from 1905 to 1910, serving an additional year as draftsman. His education included a four years' course in naval architecture at the Royal Technical college, Glasgow. From 1911 to 1915 he was assistant marine superintendent of the Anglo-American Oil Co., Ltd., London, the work comprising design and specifications for new tonnage, repairs, special surveys, underwriters' claims, vessel inspection and technical evidence in law cases. He joined the army in 1915 as a sapper, Royal engineers, retiring with the rank of major in 1919, latterly having served as deputy assistant director in the controller's department of the admiralty, being responsible for the construction of and repairs to several types of auxiliary vessels. In 1919 Mr. Turner came to New York as representative of Wilton's Engineering & Slipway Co. of Rotterdam and Burmeister & Wain, Copenhagen, and acted as surveyor and superintendent to British and American shipowners.

William T. Turner

Tolls amounting to $2,192,583.85 were collected from 495 commercial vessels that passed through the Panama canal in December, compared with tolls of $2,309,030.88, December, '29.

Bulk Cargo Movement---1930

Shipments on the Great Lakes for Last Year Compared with Ten Preceding Years

Year	Iron ore Gross tons	Coal net tons	Grain, various kinds net tons	Stone net tons	Total net tons
1930	46,582,982	38,072,060	9,841,497	12,432,628	112,519,125
1929	65,204,600	39,254,578	10,021,099	16,269,612	138,574,441
1928	53,980,874	34,823,002	16,372,116	15,677,551	127,331,248
1927	51,107,136	34,794,291	14,692,536	14,033,376	120,760,195
1926	58,537,855	31,011,544	12,087,316	12,628,244	121,289,502
1925	54,081,298	28,127,359	13,320,346	11,351,948	113,370,707
1924	42,623,572	25,860,515	15,222,787	9,225,624	98,047,327
1923	59,036,704	33,137,028	11,850,446	9,920,422	121,029,004
1922	42,613,726	19,868,925	14,267,020	7,592,137	89,455,455
1921	22,300,726	26,660,652	12,470,405	3,925,705	68,033,575
1920	58,527,226	26,409,710	6,736,348	7,821,980	106,518,531

Joins New York Office of Packing Company

ON Jan. 1 Harry W. Parsons, well known in marine circles, joined the staff of the Crane Packing Co. Mr. Parsons will be located in the company's new offices at 75 West street, Evening Post building, New York, and will have charge of the marine and industrial departments and the Western rivers.

Mr. Parsons was one of the organizers of the Propeller club and was president of the New York club in 1926. He organized the New Orleans club in that port and was elected national president from New Orleans in 1929, being re-elected last November. He has always been closely connected with organization work for the Propeller club in various ports and as national president maintains even closer contact.

Harry W. Parsons

Mr. Parsons is a native of California. He was formerly with the General Electric Co. and later joined the Foster Wheeler Corp. In 1926 he opened a branch office for the company in New Orleans and had charge of that territory until 1929. Since his return to New York, he has maintained close contact with marine affairs.

Ship Line Merger Awaits Approval of Board

FOLLOWING a special meeting of the board of directors on Jan. 6, President P. A. S. Franklin of the International Mercantile Marine Co. announced the consolidation of the company and the Roosevelt Steamship Co. He also announced that four of the Roosevelt line directors, Kermit Roosevelt, Vincent Astor, Basil Harris and John M. Franklin, had been elected to the International Mercantile Marine Co.'s board, the first three being named vice-presidents. The other members of the board are J. P. Morgan, Harry Bronner, P. A. S. Franklin, John W. Platten, Charles H. Sabin, Frederic W. Scott, Charles Steele, Charles A. Stone, Elisha Walker and J. W. Hanes. The Roosevelt line will retain its corporate identity with Mr. Roosevelt remaining as president of the company.

The International Mercantile Marine Co., formed 30 years ago by the elder J. P. Morgan, is probably the largest American shipping company, although most of its tonnage is operated under foreign flags. Its fleet totals 46 vessels of 427,769 gross tons, engaged in the following services: Panama-Pacific line and Atlantic Transport Co. of West Virginia (American flag); Leyland line, Red Star line and Atlantic Transport Co., Ltd. (foreign flag). The company also serves as agent for the White Star line, which it sold to the Royal Mail group.

The Roosevelt line was organized six years ago by Kermit Roosevelt and operates the shipping board's American Pioneer line of 18 motorships running to Australia, India and the Far East. It also controls the Baltimore Mail line, which will inaugurate a new passenger and freight service between Baltimore and Hamburg this summer. Five freighters bought from the shipping board are now being reconstructed for this service at a cost of $1,674,000.

Index for 1930

THE index for the year 1930, *covering all the valuable editorial material which appeared in* MARINE REVIEW *last year, is now ready for distribution. Copies will be sent on request, without charge, to those subscribers who have kept a complete file of copies and desire the index.*

Appointed Head of Marine Diesel Engine Sales

FAIRBANKS, MORSE & CO. announce the appointment of L. B. Jackson as manager of the marine diesel engine sales with headquarters in Chicago.

Mr. Jackson's experience has included various phases of marine work, embracing two years of deep sea experience, five years as plant engineer of the Texas Co.'s shipyard and five years as superintendent of the technical division supervising maintenance and repairs. He joined the Beloit factory of Fairbanks, Morse & Co. in 1925 where he has acted in the capacity of chief engineer for the past five years.

L. B. Jackson

Mr. Jackson was graduated from Stevens institute in 1910 with an M.E. degree.

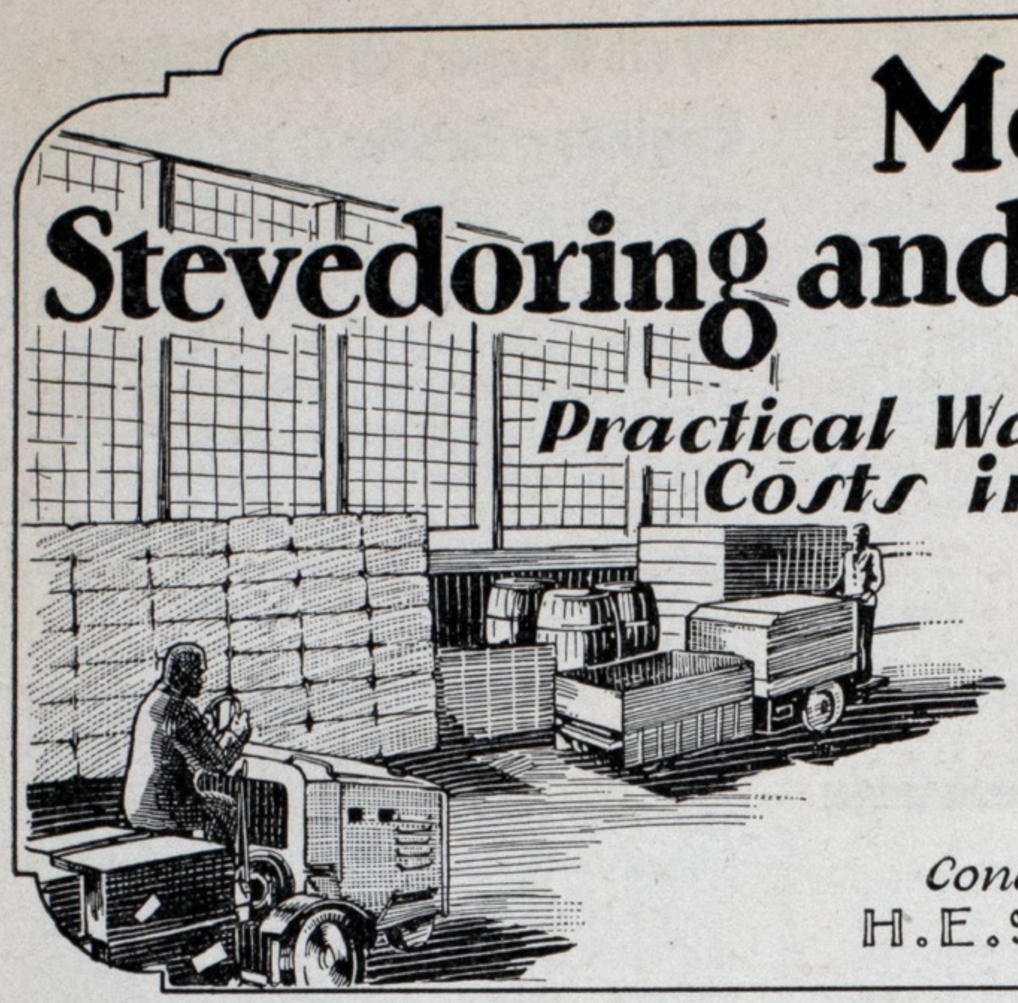
Well Known Great Lakes Engineer Retires

DOUGLAS BREWS, supervising engineer of the M. A. Hanna Co., Cleveland, who has retired after 25 years as shore engineer of the fleet, was honored with a farewell luncheon by Great Lakes vessel owners, captains and engineers at Hotel Cleveland on Dec. 26. Mr. Brews is one of the most popular and esteemed engineers on the Lakes and was presented with a testimonial album autographed by his many friends. The guests included representatives of the M. A. Hanna Co., Pittsburgh Steamship Co., Hutchinson & Co., Wilson Transit Co., American Ship Building Co., Great Lakes Towing Co., Lake Carriers association and the Steamboat Inspection service. Silas H. Hunter, United States local inspector of boilers, acted as toastmaster and made the presentation.

Douglas Brews

Mr. Brews was born in Scotland about 70 years ago. His first job in this country was with the Globe Iron Works, Cleveland. In 1885 he went out as assistant engineer on the steam yacht WINIFRED but after two years returned to the Globe Iron Works, where he remained until 1901. During his stay at the Globe yard he supervised the building and installation of machinery for the NORTHLAND, NORTHEAST and other steamers. He was chief engineer of the steamer ZENITH CITY when that boat became the first on the Great Lakes to use the watertube boiler, an innovation in engineering at that time. In 1901 he joined M. A. Hanna & Co. and supervised and brought out in rapid succession the steamers RANDOLPH S. WARNER, G. A. FLAGG and WILLIAM F. FITCH. He came ashore as fleet engineer in 1905 and supervised the building of various steamers added to the fleet since then.

T. K. Quinn of Cleveland and Charles E. Wilson of Bridgeport recently were elected vice presidents of the General Electric Co.; H. H. Barnes Jr., of New York was made a commercial vice president in charge of the New York district, and J. L. Buchanan of Bridgeport was named president of the General Electric Supply Corp., following a meeting of the board of directors of the company. At the same time the retirements of Vice Presidents Charles E. Patterson, and Cummings C. Chesney were announced.



Modern Stevedoring and Dock Management

Practical Ways to Cut Costs in Cargo Handling

Conducted by
H. E. STOCKER

Five Principles of Cargo Handling a Guide to Profitable Operation

By H. E. Stocker

FIVE fundamental principles of cargo handling may be noted as follows:

1. Economy in cargo handling is obtained by not handling it.

a. Cargo should be moved in largest practical unit.

2. The most economical movement is the shortest practical movement.

3. Cargo should be moved by mechanical equipment.

a. Perform all operations by gravity wherever practical.

b. Power should be used for long hauls, for handling heavy pieces and for moving cargo on steep grades.

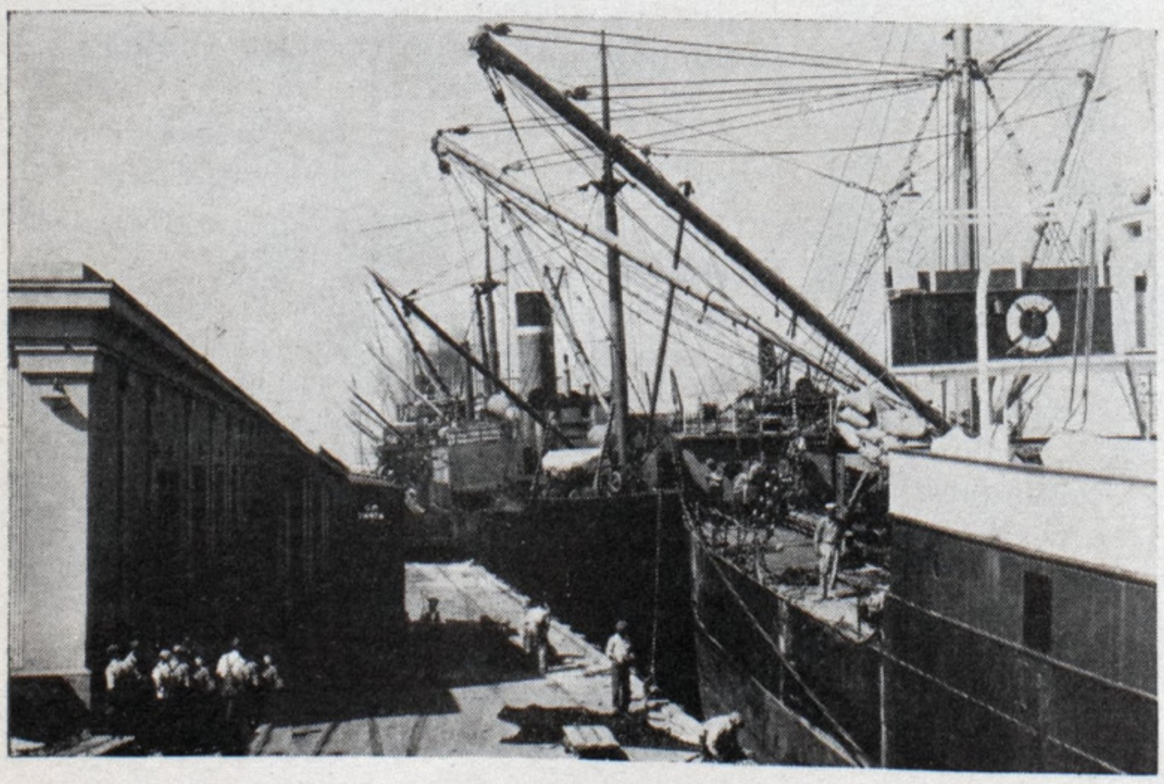
4. Resistance to trucking should be reduced to the minimum by providing smooth trucking surfaces and by use of nonfriction bearings in equipment used.

5. Adequate lighting is necessary to safe and economical operation.

Timing with a stop watch has proved that it costs around 15 cents a ton to put packages of cargo on a truck and 15 cents more to take cargo off of truck at destination. The cost of picking up and putting down amounting to 30 cents a ton.

Picking up five 98 pound sacks of flour and placing them on a truck costs 16 cents a ton on 85 cent labor. Everytime this operation is avoided 16 cents is saved, every time the ton is picked up and put down, 16 cents is added to the cost of handling. Economy in cargo handling is obtained by not handling it.

In this particular case the flour could have been loaded on a four wheel truck and moved by power. Rehandling of the bags at shipside would have been avoided. A four wheel caster type truck can be used in this operation, a practice followed at Baltimore, Norfolk and at Richmond. The trailer is used as a sling and is hoisted into the ship. This method not only eliminates one handling of the flour but it also eliminates handling of a sling. If necessary the trailers can be landed on bags in the hold without damage to the bags, or, if landed on t'ween deck hatch, tank top or other suitable surface, trucks can be moved easily by hand to or near place of stowage, thereby eliminating a second handling.



Shipside tracks are essential for economical cargo handling. Direct transfer between cars and ship reduces the number of handlings

Watch Your Operations

An important consideration in the use of four wheel trucks in the hold is that the delay and damage to freight due to longshoremen swinging and dropping the load is avoided. This method of handling is another application of the straight line production principle, "The most economical movement is the shortest practical movement." The load is dropped straight to the landing point instead of down, back and forth and then down to the landing point.

Recently at a pier where platform sling was discharging canned goods,

the hook was delayed one and one-half minutes because the four wheel truck was not centered under the hook. The load had to be swung back and forth to get it on the truck.

The second part of the first principle—Cargo should be moved in largest practical units—is applied by the use of skids, trailers and four wheel trucks for handling cargo. Instead of handling five bags of flour on a two wheel hand truck, 20 to 25 bags can be moved on a fourwheel truck, on a trailer or skid. Instead of moving 20 cases of toothpicks on a hand truck, a three by six foot trailer will handle 210 cases at a time.

Unquestionably much handling of cargo could be eliminated if shippers, shipping companies, railroad companies and consignees would cooperate so that cargo would be in heavier units. In some cases this has been done to advantage but the fullest development has been retarded by failure to understand the high cost of handling, or from inertia or from resistance to the influx of new ideas.

Other Important Principles

The second principle is put into practice if the railroad car is placed close to the hatch into which the cargo is going and if trucking is in as straight a line as possible. At one terminal, while trucking freight from the dock into the ship the trucking distance was increased 20 per cent because a hand truck was blocking the shorter route and no one, including the man in charge, removed it. The application of this principle of the most economical movement is not always so simple.

The third principle is applied by the use of trailers with gasoline or electric tractors. Heavily loaded trailers can be moved up steep gangways and over rough floors by power tractors without difficulty.

Part of the third principle—to perform all operations by gravity wherever practical—is exemplified by the use of gravity conveyors in handling packages from the deck of a ship to the terminal. Another application of the gravity principle is the use of gravity roller conveyors for moving cargo from the wings to the square of the hatch and vice versa. Use of short lengths of conveyor for this work often prove very profitable.

The use of gravity roller conveyors for moving packages from the forward ends of street trucks to the station platform has proved a good way to expedite the discharge of trucks at the Boston and Maine freight station at Boston. The same method is applicable at many marine terminals. Gravity roller conveyors often prove economical in handling freight into and out of cars. The Clark Equipment Co. uses a simple arrangement for loading automobile wheels into box cars. The wheels roll in a steel trough which has just enough incline to cause the wheels to roll at the proper speed.

Mechanical handling machinery can be used to cut cost. Conveyors applied at Houston to handle bags of coffee and sugar from shipside to warehouse

The five principles stated in the beginning are applicable also with respect to the cargo handling features of the ship. The first principle obtains by substituting steel hatch covers for wooden hatch covers which effect a reduction in handling costs. If the ship has bulwarks instead of rails, the second principle would be applied if the bulwarks were hinged opposite hatches. This permits a shorter distance travel for the hook and is therefore an application of the straight line production principle.

The third principle applies to booms and winches. Many booms and winches are inadequate, the booms are short and insufficient in number, the winches slow.

These five principles are also applicable to the cargo handling features of terminals. A terminal designed without shipside tracks where direct rail deliveries and shipments are possible, overlooks the first principle. Cars arriving for a ship must be unloaded at the tracks in the center of the pier or at the bulkhead and handled across or along the pier to the hatch into which the shipment is going. If shipside tracks are provided, steel plates, boxed automobiles, etc., can be handled direct from car to ship. The economy of this manner of handling as compared with handling over the pier is indicated by the following car loading and unloading charges at Los Angeles. The charge for loading marble blocks direct into cars is 60 cents a ton. When the blocks are handled across the terminal into cars, the charge is $1, 66 2/3 per cent more.

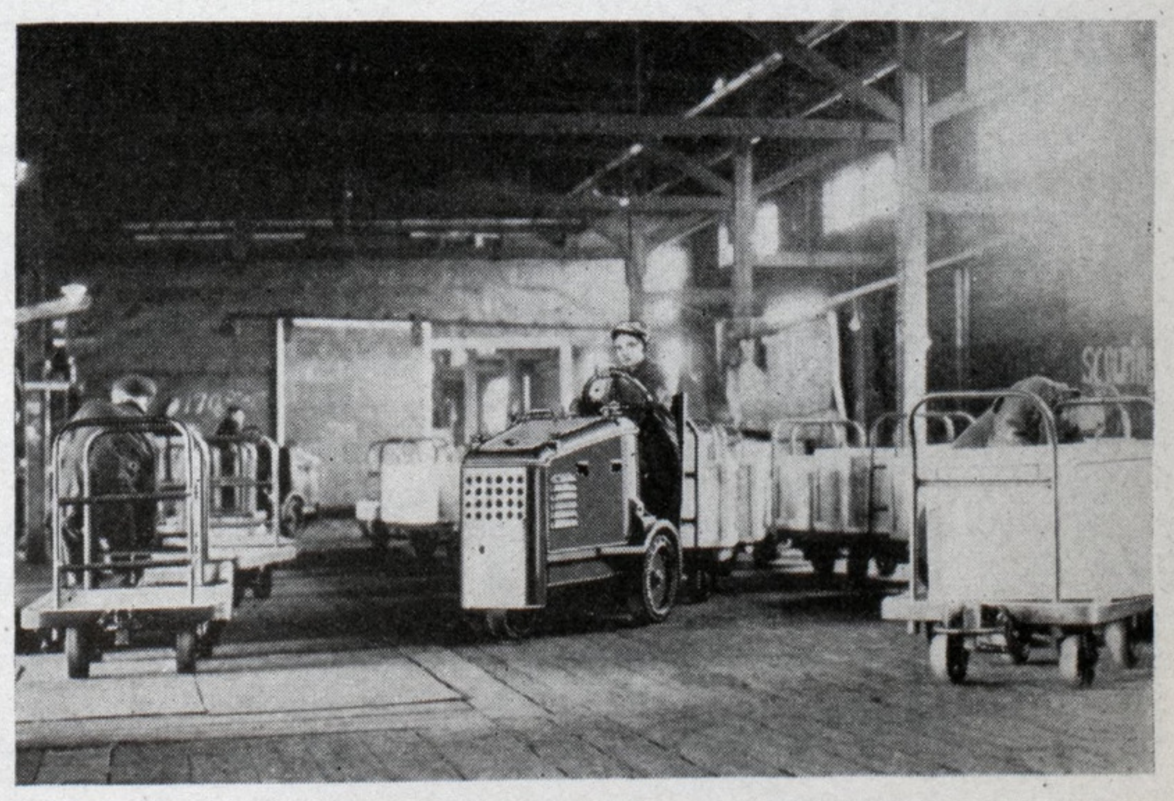
When the cargo is handled to and from box cars, unless sufficient space is provided between the outside track and the side of the pier to permit erection of a platform, direct handling of box car freight is either impossible or difficult and expensive. If box cars must be unloaded to the pier and then hauled to the hatch, there is extra handling and the short line production principle is not applied as compared with terminals so designed that box car shipments may be handled direct from car to ship.

The third principle is applied by the use of gasoline and electric trucks, hand lift trucks, cranes, etc.

Good floors add much to economical cargo handling and good lighting is essential to the best work.

The fourth principle needs no discussion in view of the treatment given it from time to time in articles appearing in the past.

The fifth principle is covered by Mr. Morison's article on lighting which appeared in the September 1930 issue of MARINE REVIEW.



Handling can be reduced to a minimum by keeping cargo on wheels. Conditions must be studied to determine type of equipment best suitable

Joint System Stands Strain at Northwest Seaports

By R. C. Hill

DEPRESSION in the overseas trade, resulting in less work for longshoremen and truckers last year, emphasized the close and friendly relations existing between employers and employes in Seattle and other Pacific coast ports where the joint system is in effect. This joint shop plan was explained in detail in MARINE REVIEW for March, 1930, page 46. In brief it consists of co-operative effort to furnish the employer with competent and efficient labor and to give the men living wages and conditions and a fair division of the work.

During the latter months of 1930 when water borne traffic registered a marked decline, the joint shop plan underwent the acid test but it continued to function as satisfactorily as it did when conditions for both employers and labor were much more favorable.

Work Is Evenly Distributed

Briefly stated, the plan offers the men many advantages, not the least important of which has impressed itself during the months of hard times. It has erected an invisible wall along the waterfront. What work is available is being equitably distributed among the regular listed workers. The thousands of men who have floated to the seaports in search of employment are barred from stevedoring and trucking. The permanent employes are thus protected at a time when they need protection.

Furthermore the wage scale per hour remains the same as during periods of prosperity. Were the joint plan not in vogue, it is easy to imagine that the influx of outside labor, eagerly seeking work, might have displaced the regular men on the waterfront at reduced wages. This situation is impossible under the joint shop plan, originating in Seattle some ten years ago and which has since made for peace and friendly understanding between employing companies and the men who handle cargo.

No amount of influence or argument can get an outsider a job on the Seattle waterfront. Requests from steamship officials, bankers or other men of business standing have no weight in asking the management of the joint shop plan to give an unlisted man a job. The regular workers appreciate this protection. The industry is in the position of a factory which has reduced its working time from six to five days a week but is giving its regular personnel as much work as is possible in the circumstances.

Figures recently compiled show that because of the decrease in water traffic, waterfront workers in Seattle have suffered a reduction of 15 to 25 per cent monthly in average income. The average monthly wage in 1929 was close to $150 per man. Toward the end of 1930 the same men were earning from $115 to $130 per month, although the same hourly wage scale was paid. The same compilation indicates that the average period of employment was 130 hours, 200 hours being considered a full month. Every effort is being made, and with much success, to apportion the work available among the regular longshoremen and truckers on the basis of earnings. In other words the object in view is to give preference to men with low incomes so that their wages per month may approximate those of their fellows. No favorites are played and as nearly as is humanly possible the distribution of work, and likewise of earnings, is being made on a fair basis. Approximately 1500 men are being employed on the local waterfront but although their income is reduced from the previous level they are all earning sufficient to keep themselves and families. The extra spare time is used by some of the more thrifty in outside jobs or in working on their small pieces of ground.

Wage Scale Remains Same

While it cannot be said that the men are all satisfied, they realize that the joint shop plan has given them greater protection than could the union. The wage scale has not been cut, working regulations have not been changed, they are secure in their jobs and the depression has brought no strike as is frequently the case under similar conditions.

"The men understand that reduced income is no fault of the employers," said an executive of the joint organization. "They have undoubtedly taken a severe jolt on the chin but they are not complaining. Our men are co-operating splendidly and with the employers are carrying their share of the burden of business depression."

Here is the viewpoint of an intelligent and observing longshoreman who was asked to offer criticism on behalf of the workers:

"One of our grievances is that the executive committee does not seem to be functioning as it should. I believe this is true mostly of the labor members of the committee. We find it difficult to get aggressive and intelligent workers to serve. Of course they get paid for committee work, providing they are taken off the job for meetings, but our fellows do not care much for this so-called honor. It is hard to get our men interested in fighting for our general welfare. The workers' general attitude on this phase is to 'let George do it.'

"One of the best things the executive committee did was to organize the black gang. In other words all the registered colored workers are worked together in one gang by themselves. This has removed some feeling between the whites and negroes. But the colored workers get the same chance at the jobs as we do and thus everybody is more satisfied.

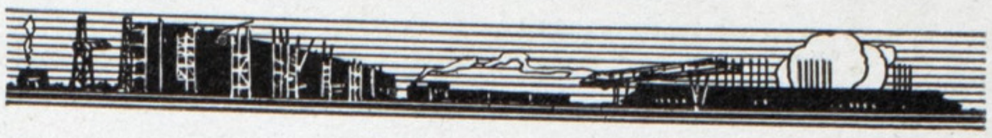
"I believe that the joint shop plan is the best in the circumstances. I realize that I am not earning as much as last year but that can't be helped. The employers are giving us all the work they have and they have not cut wages. That shows their fairness.

"The number of listed men has decreased since a year ago and it continues to grow smaller. This is due to the fact that there is less work and in the existing conditions no new men are being added. Some have died, some moved away, others have gone into other work. So that leaves a smaller number of active, regular workers, which is a good thing seeing that there is less work than a year ago. I shudder to think what would have happened under former conditions. It would have meant trouble, for outside labor would be seeking our jobs at reduced wages. There certainly would have been a strike with consequent loss to all concerned. I am not earning as much by any means but at least my family is eating and we hope for better times soon.

Manager Shows Wisdom

"I want to say that the manager of the hall seems to show uncanny wisdom in selecting the proper men for the job. You know some classes of longshoring are specialized labor and the manager has no easy task in satisfying both sides. For instance steam schooner work is a job that every man cannot do. That's just an illustration. But the manager makes every effort to select men on the basis of equalized earnings and while there are always some kickers, the system is working as well as could be expected."

Useful Hints on Cargo Handling



THIS page is to be devoted to short items on all matters having to do with the more efficient turnaround of ships. These items are intended to be of a helpful nature.

We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.

WHEN two wheel hand trucks are used for handling rolls of newsprint paper, the trucks must be covered to prevent damage to rolls. Old automobile casings serve this purpose very well. The casings are tied around the framework of the truck to prevent damage by sharp corners or bolt heads. In addition a butt block made from two 2 x 12-inch pieces of lumber cradled out on top to receive the roll and covered with automobile casing, is placed across the lower part of the truck.

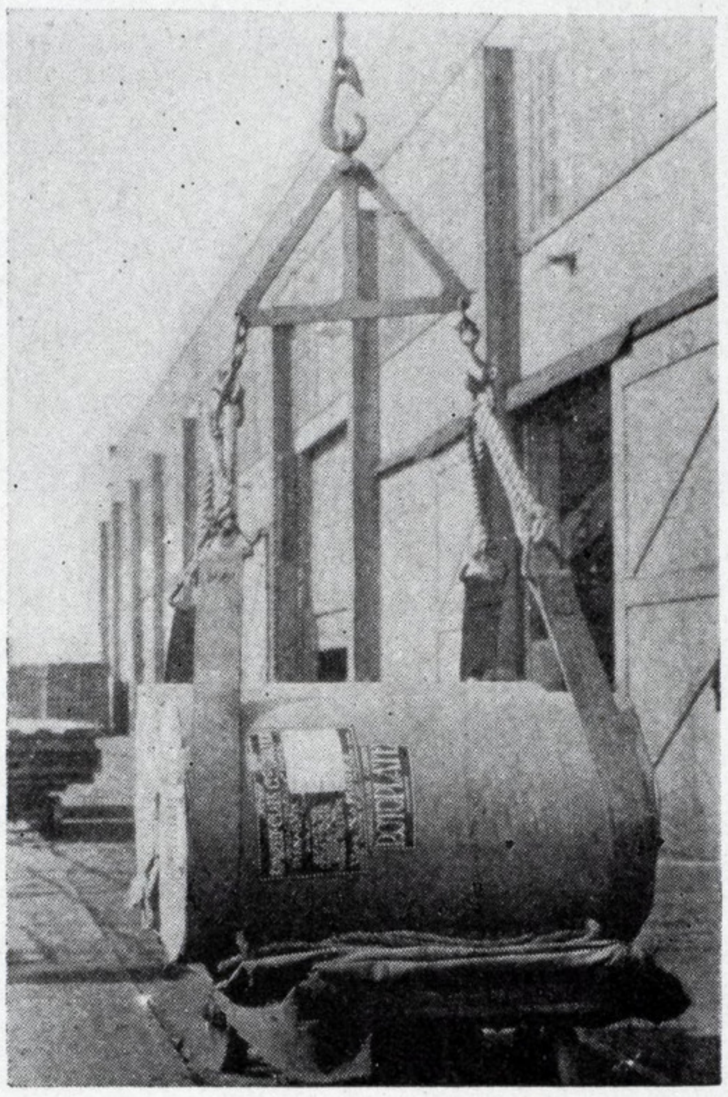
Experience has shown that this rubber covering over the butt block is of great assistance in holding the roll and preventing it from slipping forward when it is being broken over onto the truck.

A board also covered with casing is placed near the end of the truck handles. This is held in position by ropes which are passed through holes bored horizontally through the piece and thrown over the handles of the truck so they may be removed at any time.

Two helpers are used in loading large rolls. A man is stationed on each side of the truck with a light flexible cable which has a hand hold spliced in each end. The cable is slipped behind the roll and about half way down it. The trucker runs the butt block against the roll and at the same time he starts to break the truck down, the two helpers heave on the cable, throwing the roll over and hold it in place until the truck handles are down far enough so the roll cannot slip.

When the roll is unloaded. It must be dumped over so that it hits flush on the end and is not allowed to slide off and hit on the edge.

If it is necessary to drive a roll tighter together with the other rolls on the floor, the best method is to hold a 4 x 4 against the roll and use the truck as a battering ram to move the roll.



Special canvas belt sling and spreader

When the volume of newsprint business justifies the expense, it is more economical to handle newsprint by means of gasoline or electric newsprint trucks.

The Portland Terminal Co. reports that the new chisel trucks provided for the new terminal together with increased slingloads has increased discharging of bales of woodpulp from the maximum of 900 tons in eight hours to 1500 tons in eight hours.

Taking Care of Rigging

WHERE a single topping lift is used it is often found difficult to prevent the tackle from chafing on the chain, but it can be prevented if a piece of suitable steel is cut to the shape of a heart. Shackle the pointed end of the heart in the wire, the tackle on one side and the chain on the other side of the widest part of the heart. When the strain is on the tackle the chain will swing clear and so will the tackle when the strain is on the chain.

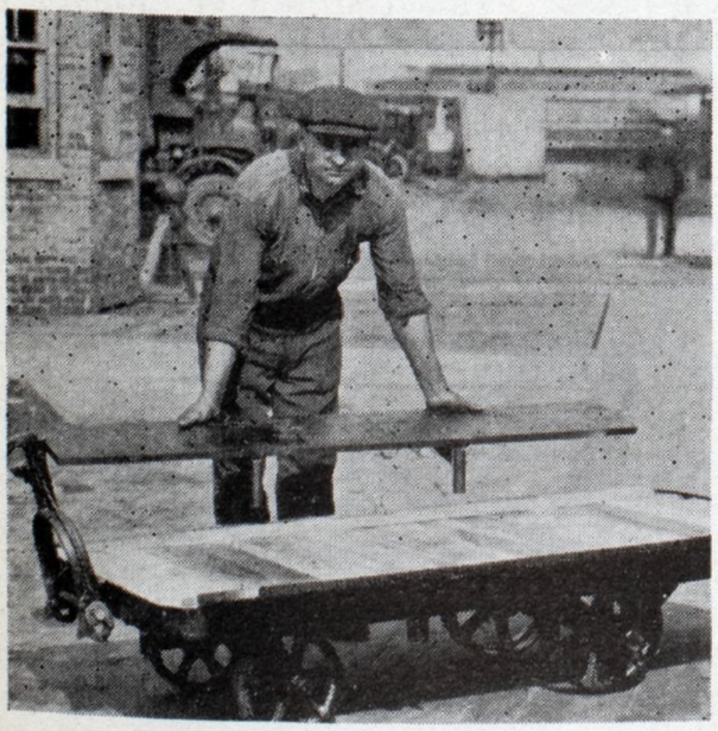
Turnbuckles holding the rigging are often found to be frozen and rusted, so when some particular cargo has to be loaded or discharged and the rigging taken up expensive delays are often experienced on account of the frozen turnbuckles. This can be prevented and the overhauling of the turnbuckles made easy by drilling and tapping a small hole two treads from the top of the buckle and cutting a longitudal grove perpendicular on the treads. With a grease gun sufficient grease or oil can be forced in the turnbuckle trough the tapped hole and grove to keep it from rusting.

Handling Finished Lumber

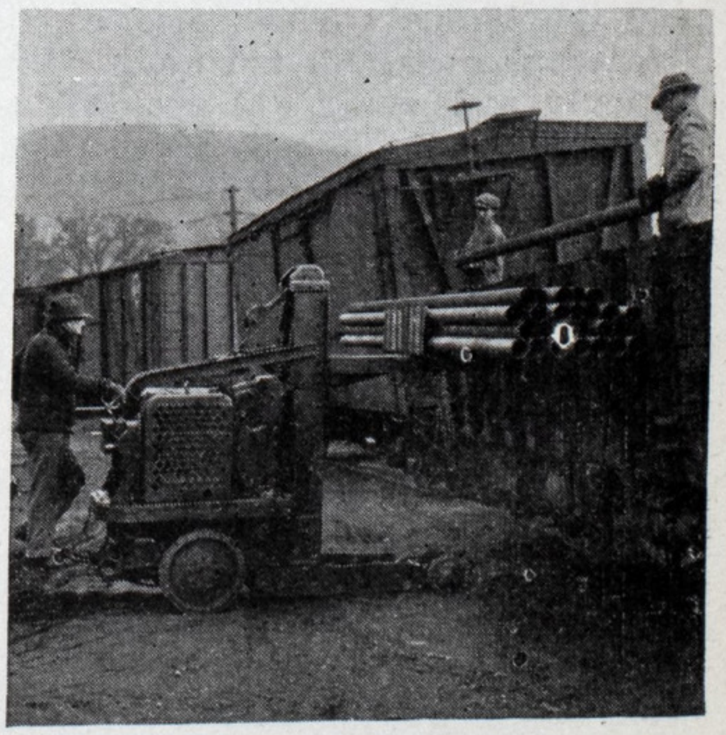
A NEW system of handling finished lumber is being tried out on the Pacific coast at the Weyerhaeuser mills, Everett, Wash., where flooring is ready cut to one length and sealed in bundles of five or six pieces with grade, length and brand on the seal which not only protects ends but guarantees grade.

These bundles are further protected by being completely surrounded by one or two layers of two by fours on top, bottom and sides which are similarly all of one length but a length somewhat longer. The out side timbers are not sealed and provide for some flexibility and deformation of the load in handling without damaging the interior lumber.

This would seem to be the remedy for flooring arriving with the bead cut off by slings used in handling and solve the question of grade.



Flair boards increase cubic capacity of trailers in handling light packages



High lift trucks help in loading and unloading gondola railroad cars

Personal Sketches of Marine Men

Edward P. Farley, Founder of Edward P. Farley & Co.

By Ben K. Price

Photo by Blank & Stoller Inc.

HIS first connection with shipping, in his early twenties, was as a shipowner and broker in Chicago.

HE WAS selected as vice president of the Emergency Fleet Corp. and later shipping board chairman.

NOW an influential figure in marine affairs as director of steamship and shipbuilding companies.

SINCE Edward P. Farley, then in his early twenties, established himself as a ship owner and broker in Chicago, his star has been constantly in the ascendance in the marine shipping world. Associated in the construction of mine sweepers for the French government in Canada during the World war, vice president of the Emergency Fleet Corp. and, latterly, chairman of the United States shipping board—these are a few of the highlights in the career of a man who is now but 44 years of age. Nor have his activities been confined alone to marine shipping. Banking, air transportation, food packing, manufacturing all have and do continue to lay claims to his attention.

Studying chemical engineering at the University of Wisconsin, Madison, Wis., his birthplace, Mr. Farley upon leaving school turned his attention to marine engineering. He engaged in this work for two years prior to organizing his own ship brokerage company. Later, he became affiliated with James Playfair, of Midland, Ont., in the operation of the Glenn Transportation Co. and the Waukau Transportation Co., both engaged in Great Lakes and St. Lawrence river traffic, particularly in pulp and paper. A son-in-law of the late C. V. Inderrieden, of Chicago, he also became early interested in the J. B. Inderrieden Co., that city, packer of food products.

In 1921 he accepted the vice presidency of the Emergency Fleet Corp. to organize and supervise the early sales activities of the corporation in the disposal of its ships and surplus supplies, a work for which he was admirably suited both in point of experience and ability.

At that time the shipping board's properties involved 3444 units from steel passenger-cargo ships to wooden vessels and tugs and barges. Miscellaneous equipment and supplies were valued at millions of dollars. Minimum prices were set on several of the more important classes of tonnage, including the new famous $30 per deadweight ton minimum on steel ocean-going cargo tonnage, which comprised the bulk of the fleets. During the two years or so under Mr. Farley's direct supervision more than 460 vessels of one class or another were sold, notwithstanding adverse conditions in the world market for ships, and virtually all of the other surplus properties.

In June, 1923, he was appointed chairman of the shipping board to serve for the unexpired term of A. D. Lasker, Chicago, resigned. At the close of that year Mr. Farley also retired to again engage in his own various enterprises which were becoming increasingly pressing.

In 1924, he incorporated the firm of Edward P. Farley & Co. under the laws of Delaware. While maintaining a branch in Chicago, executive offices of the company which was first formed in that city in 1912 were transferred to New York, where Mr. Farley now has his home.

The diversified business interests of Mr. Farley are reflected in the following partial list of his affiliations: Director and chairman of the executive committee of the American Hawaiian Steamship Co.; director and member of the executive committee of the American Shipbuilding Co., Cleveland and chairman of the executive committee of the Pacific Zeppelin Co., New York. He is also a director of the Commercial National Bank & Trust Co., the Thompson-Starrett Co., and the Dublier Condenser Co., all of New York.

He is a member of such shipping groups as the India House, and the Rookery, the latter with its clubrooms high in a downtown skyscraper in New York; also the Whitehall club of that city. He is an associate member of the Society of Naval Architects and Marine Engineers, and is associated with such business organizations as the New York chamber of commerce and the New York Merchants' association.

Other affiliations include the New York Yacht and Metropolitan clubs, New York; the Creek and Deepdale Golf club on Long Island; the Metropolitan and Chevey Chase clubs in Washington; the Chicago, University and Racket clubs in Chicago; and the Pacific Union in San Francisco.

Mr. Farley spends his winters at Santa Barbara, Calif.

Table VI

Naval Shipbuilding

Present Status of Naval Construction with Particular Reference to 15 Light Cruisers and One Airplane Carrier Act of Congress Feb. 13, 1929

Name	Contract let	Contract Completion Date	Displacement	Speed	Battery Main	Battery Anti Air	To Whom Awarded
New Orleans	6/29/29	6/2/33	10,000	....	9-8 inch	8-5 inch	New York Navy Yard
Portland	6/29/29	8/15/32	10,000	32.5	9-8 inch	8-5 inch	Beth. S. B. Corp. Quincy
Astoria	7/ 3/29	10/2/33	10,000	....	9-8 inch	8-5 inch	Puget Sd. Navy. Yd.
Indianapolis	7/ 3/29	8/15/32	10,000	32.5	9-8 inch	8-5 inch	N. Y. S. B. Co. Camden
Minneapolis	7/ 3/29	10/2/33	10,000	....	9-8 inch	8-5 inch	Phila. Navy Yard
Light Cruiser 37—	Bids to be opened 2/11/31.						
Light Cruiser 38	Recently 2/11/34						Mare Island Navy Yd.
Light Cruiser 39—	Not to be laid down before 1933 (London Treaty Art. 18).						
Light Cruiser 40—	Not to be laid down before 1934 (London Treaty Art. 18).						
Light Cruiser 41—	Not to be laid down before 1935 (London Treaty Art. 18).						
Light Cruisers—42, 43, 44, 45, 46.	Not to be built (London Treaty Art. 18).						
Ranger	10/17/30	3/ 1/34	13,800	Airplane Carrier			Newport News S. B. Co.
Submarine V-7		8/ 1/32					Portsmouth Navy Yd.
Submarine V-8—	Probably laid down in 1931 (Funds available Act 3/2/29).						
Submarine V-9—	Probably laid down in 1931 (Funds available Act 3/2/29).						
12 Destroyers Nos.—	348-359 inclusive (Authorized by Act of Aug. 29, 1916) No Funds for Construction						
1 Transport No. 2—	(Authorized by Act of Aug. 29, 1916) No Funds for Construction						
1 Neff Submarine No.	108 (Authorized by Act of Aug. 29, 1916) No Funds for Construction						

Compiled by Marine Review

Shipbuilding in U. S.

(*Continued from Page* 21)

for two additional submarines.

Immediate prospects for further construction depend entirely on what congress and the President will do. Authority of congress in the act of Aug. 29, 1916 for 12 destroyers is sufficient for the appropriation of funds for one destroyer leader and 10 destroyers included in the navy department program for the next fiscal year. The current proposed naval construction bill in congress is given in Table VII.

This program is only a modest beginning of a treaty navy at best and all of it should be approved by congress with additional authorization for construction each year until we have a treaty navy which will mean parity with Great Britain and the allowable ratio with Japan.

Fourth Marine Conference

(*Continued from Page* 34)

the outset it had been planned to permit domestic American shipping to pass through the canal without toll, but by treaty this had been overruled. He condemned the Roch bill, now pending in the senate, which would advance the rates, and pleaded for a new consideration of the whole matter with a view to equitable division of the maintenance and depreciation costs between commercial and naval vessels.

Questions dealing with the award of ocean mail contracts, as authorized by the Jones-White law were discussed by Assistant Postmaster General W. Irving Glover. Mr. Glover cited the benefits in the way of new shipbuilding which have been derived from the ocean mail contracts and pointed out that, in all probabilities, several more contracts

Table VII

Naval Shipbuilding

Proposals for New Naval Construction in Congress

Bill H. R. 14688 introduced by Mr. Britten Dec. 8, 1930 and a similar bill S-5288 introduced by Senator Hale "to authorize the construction of certain naval vessels and for other purposes." We are concerned with only the section of this bill which calls for—

(a) **One aircraft carrier,** including armor, armament, ammunition and airplanes	$27,650,000
(b) **One flying deck cruiser,** including armor, armament, ammunition and airplanes	20,780,000
(c) **One cruiser,** including armor, armament, ammunition and airplanes	16,605,000
(d) **Four submarines,** including armor, armament, and ammunition at $4,400,000 each	17,600,000
Total	$82,635,000

Compiled by Marine Review

which will carry with them requirements for further new construction are yet to be negotiated.

He cautioned the shipping men against dissension, saying:

"Let me say with all the earnestness at my command that if the various shipping groups of this country do not get together and amicably settle their differences before they appeal for contracts for mail pay, and I refer to instances where great objection has been made by one line against another with the thought that a line is receiving more than its fair share of mail money, that this or that trade territory belongs to this line alone, that all seaboard sections of the country shall have a share in the merchant marine plans, and many other reasons too numerous to mention; then the day will fast come when congress will take a hand and make it impossible for a further continuance of the broad and intelligent development of the merchant marine policy of the United States."

Senator Royal S. Copeland of New York then spoke on the subject of an investigation of the shipping board and other agencies administering laws pertaining to shipping which is being sought by Senator McKellar of Tennessee. He declared that he could see no justification for such an investigation at this time.

Committees appointed at the third national conference held a year ago then made their reports. These reports dealt with marine insurance, which was presented by Vice Chairman Edward C. Plummer; safety of marine workers, which was presented by Robert F. Hand, vice president of the Standard Shipping Co.; reduction differential between shipbuilding costs here and abroad, presented by H. G. Smith, president National Council of American Shipbuilders and government aid to American ships not benefited by mail contracts, presented by H. B. Walker, president, American Steamship Owners association.

In discussing the subjects of modernization of the American merchant marine, Homer L. Ferguson, president of the Newport News Shipbuilding & Dry Dock Co., called attention to the advances that have been made in safety at sea during the past decade. "American ships being built today for carriage of passengers and freight present a higher degree of safety than any other ships being built anywhere else in the world," Mr. Ferguson said.

C. L. Bardo president of the New York Shipbuilding Co., also took up the topic discussed by Mr. Ferguson and called attention to the antiquity and obsolescence of the bulk of the ships making up the American merchant marine. More than 500,000 tons of our ships are more than 20 years old, he said, and the majority of the war-built vessels are now obsolete. Mr. Bardo called attention to further ways in which the government could be of assistance to the shipyards, particularly by assuring them of all the navy's shipbuilding work. Under existing law, he pointed out, half of the cruiser construction program must be carried out in navy yards.

Lake Shipping Man Dies

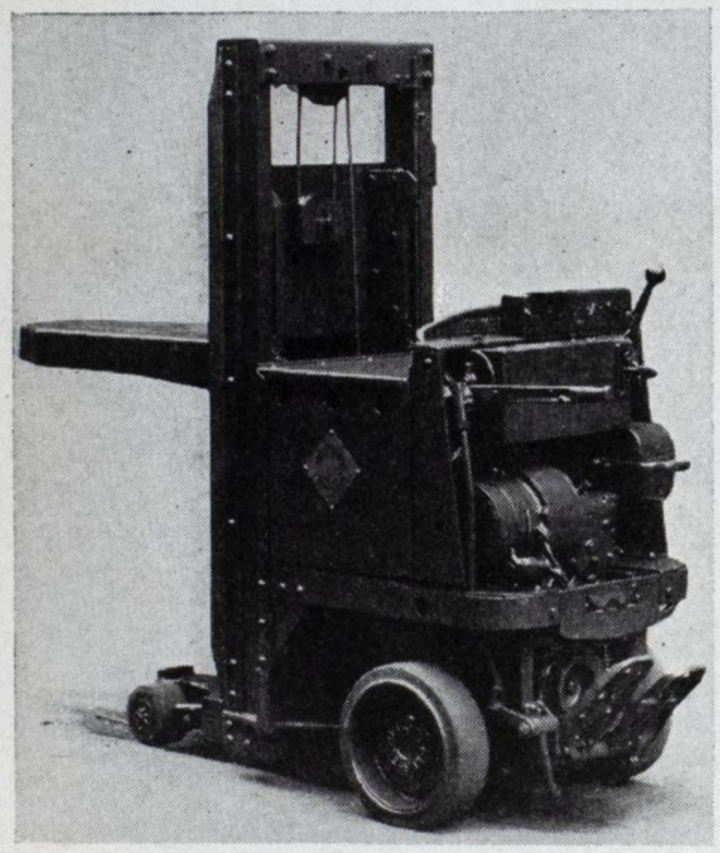
Funeral services were held Saturday afternoon Jan. 24 for C. D. Dyer who for many years was connected with Great Lakes Shipping. Mr. Dyer was 71 years old. He was, until retirement a few years ago, vice president of the Shenango Furnace Co., a director of the Great Lakes Towing Co., member of the executive committee of the Lake Carriers Association, and a member of the advisory committee of the Great Lakes Protective association. During the World war, Mr. Dyer was active in the mobiiization of ships on the Great Lakes engaged in transportation of commodities under direction of the federal govern-

Equipment Used Afloat and Ashore

Miniature Tiering Truck—Propeller Type Blower—High Pressure Oil Engine—Protecting Stern Tubes—Flanged Joint—Speed Control—Light Ventilator—Lift Truck

A MINIATURE tiering truck, 29 inches in width, is of interest to industrialists because it is so well suited to existing narrow aisles in the average shop, store, or warehouse. Stockroom floor space is usually squeezed to the minimum so that bins are run as close to the ceiling as sprinkler systems permit. Consequently the aisles are narrowed to the space an attendant requires to store or remove an order.

The tiering truck illustrated, manufactured by the Elwell-Parker Electric Co., Cleveland, has a capacity of



Small 3000-Pound Capacity Tiering Truck

3000 pounds. Its 18 by 41 by 7-inch height platform will handle a 24 to 30 by 48-inch skid or container to a height of 63 inches, the overall height being 83 inches for 7-foot doorways or box car entrance. The small machine is an entirely new development in low capacity industrial high lift trucks, while the auxiliary boom on the fork truck makes the machine serve two purposes of lifting and carrying heavy loads with the man power of one operator.

This 3000-pound machine has each important unit found in the 35,000-pound haulage tool, all on a smaller scale. The same safety features and system of control are built to enable the same operator to drive it if necessary. The system of lifts is by worm gear speed reduction to cables that elevate the cantilever platform.

The drive axle is of the full floating silent worm gear type fitted with 20 x 5-inch press-on type tires. The trail axle beneath the 7-inch high platform is fitted with 6½ x 4-inch tires. All four wheels are steered by means of automobile type ball and socket fitted levers. The truck may be fitted with battery or gas-electric power to perform a full day's work, with efficiency and dispatch.

Error Is Corrected

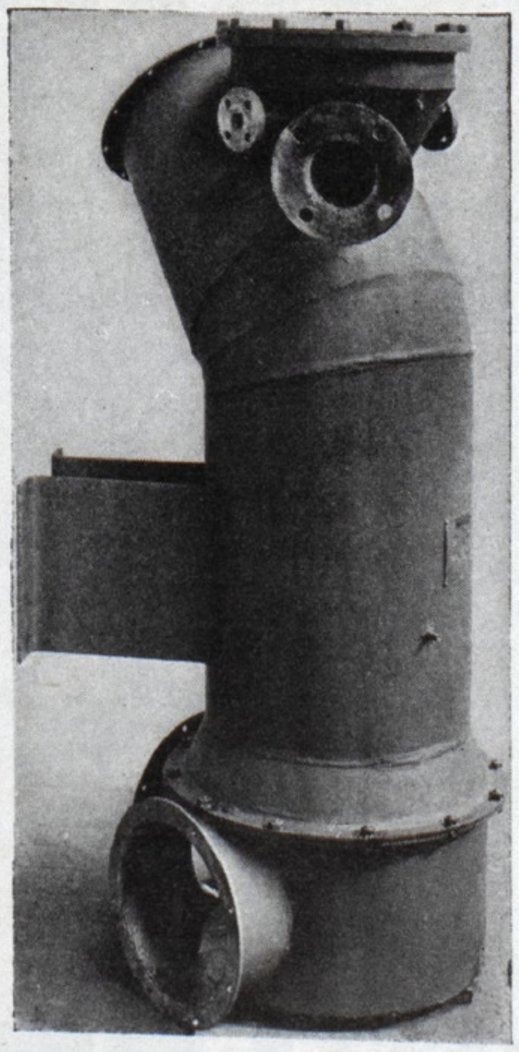
In the January issue on page 53 under the heading "Propeller Type Blower Will Exhaust Gases" the wrong illustration was used. This item is republished below using tne proper illustration. The item covering the cut used incorrectly appears on the opposite page.

Propeller Type Blower Will Exhaust Gases

THIS unusual looking piece of equipment is a Westinghouse propeller-type blower of special design which is to be installed on a gasoline tanker to exhaust the gases from the pump room to the atmosphere. The blower is turbine driven and is rated at 6000 cubic feet per minute at 4-inch static pressure.

The entire unit is of welded steel construction and of extremely simple design. The propeller is three-bladed and is driven by a single-wheel turbine having inside buckets milled in the wheel, through a steel shaft supported in grease-lubricated bearings.

This is another application of the Westinghouse blower, which is an invention of H. F. Schmidt, consulting engineer, and is built at the South Philadelphia works of the Westinghouse Electric & Mfg. Co.



Welded Propeller Type Blower

Announce New Oil Engine without High Pressure

EMPLOYING vacuum rather than high pressure for vaporizing fuel oil, the new Murray & Tregurtha oil engine has been placed on the market in 4 cylinder, 65 horsepower and 6 cylinder 110 horsepower models. This is the product of one of the pioneer engine manufacturers, Murray & Tregurtha, Inc., of North Quincy, Mass., established in 1891.

This new power plant is not a diesel engine. It is the first of a distinct type in which a nebulizer mechanically processes furnace oil, distillates and diesel oils usually used by diesel engines of like power. The practically dry vapor resulting from the process carried out in this nebulizer is burned in the engine with clear exhaust, absence of odor, soot, sparks from incandescent carbon or smoke.

Because this engine burns a dry vapor there are no deposits or carbon-and-oil mixtures fouling these parts and "caking" onto the parts coming in contact with combustion. The heat of vaporization is always well below the "cracking" point of the fuel, hence no carbon deposits can form.

Through the use of low cost distillates and diesel oils, the cost of operation is cut in half as compared with a gasoline engine of equal power in the same service.

New Compound Protects Stern Tubes in Winter

THE B. F. Goodrich Rubber Co. have developed a very interesting method of protecting stern tubes from troubles caused by freezing during the winter lay-up of lake vessels.

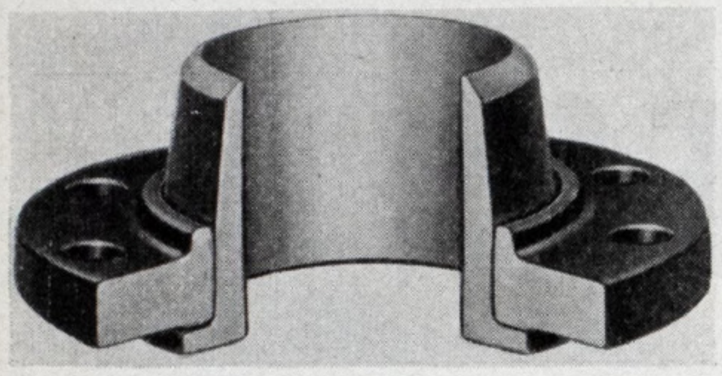
In place of customary grease and other compounds, usually used in the stern tubes between the after stern bearing and the forward stuffing gland, this new compound is free from all oil and grease and contains nothing of an injurious nature to rubber, such as is used in Cutless rubber stern bearings or on the rubber, as used for shaft coverings.

The same method of introducing this compound into the stern tube is used.

In the spring of the year when the vessel goes into operation, the water from the service line connected to the stern tube is used to flush out the compound. This material is said to cost no more than the materials now used for this service.

New Type Flanged Joint Has Great Flexibility

A NEW type of flanged joint has been developed for use in connection with welded pipe lines where such a joint is required for the insertion of valves and fittings for the taking off of outlets. It is known as the "Merco" swivel flange and is a unique device possessing fully the inherent flexibility of the ordinary type of flange, plus the strength of an ordinary butt welded flange, according to the manufacturers. It consists of a drop forged steel flange,



A New Type of Flanged Joint

fitted to a drop forged tapered nipple on which the flange may be rotated, permitting alignment of bolts, etc. The tapered nipple is forged from a solid steel billet and the finished product incorporates a thickness much greater than pipe at the base of the nipple where highest stress occurs. Being formed completely at the proper forging temperature, possibility of a fracture of the solid billet sufficient heat is stored up in the steel to permit operation being finished at the correct forging temperature.

The manufacturers are arranging production to soon make available sizes from 1½ inches to 10 inches, and specifications are to meet the American standards.

This swivel flange offers an additional advantage where service requires a special alloy such as the new chrome nickel steels. Merco Nordstrom Valve Co., San Francisco, are the manufacturers.

Speeds Are Synchronized by New Control System

EXACT agreement of operating speeds of two or more non-synchronous electric motors can now be maintained by means of a new control system announced by the General Electric Co. This system, in which "selsyns" (small self-synchronizing motors) play a fundamental part, is expected to be of great advantage in industrial applications where synchronous operation of different machines or devices is essential.

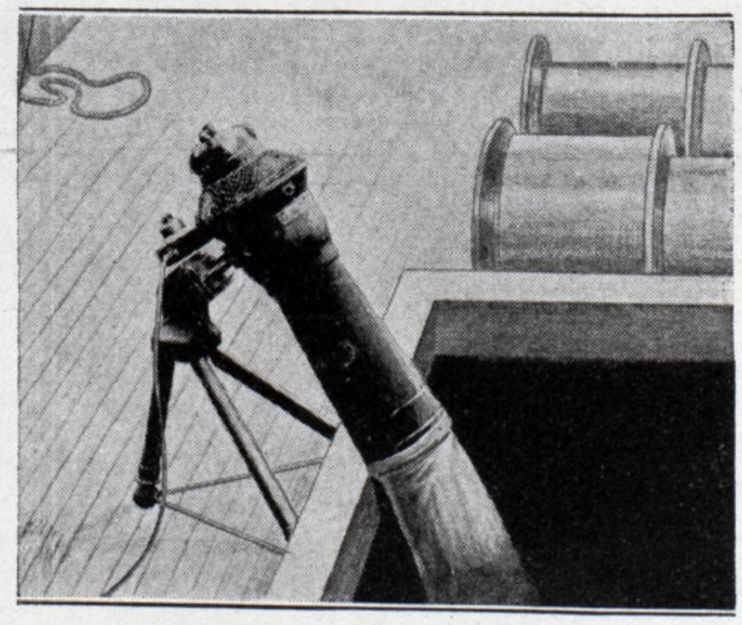
The first application of the new control system has been made at the Keystone Portland Cement Co.'s plant at Bath, Pa. Its duty there is to maintain the feed of raw material exactly proportional to the speed of the kiln. This is accomplished by holding the speed of the feeder motor in synchronism with the speed of the kiln motor. Thus the rate of slurry feed into the kiln is always proportional to the speed of the kiln, a feature here considered essential to the production of clinker.

Light Weight Ventilator Can be Used Many Ways

A QUICK and efficient method for auxiliary ventilation of ships is presented in a new type of light weight blower that can be used for ventilation of holds, engine rooms, tanks and confined spaces where the air supply is below par. The convenience of the unit is a feature. It is mounted on a swivel jointed tripod which allows the diffuser outlet to be placed at any desired angle so that the air supply is directed where it is most needed. It weighs less than 100 pounds and can be quickly set up and put into operation by one man.

The fan is of the propeller type. Stationary guide vanes of special design are used beyond the propeller. The air current leaving the propeller is radially sub-divided by the individual guide vane blades and taken up by them without shock.

The guide vane blades, which have a curvature increasing in the direction of rotation of the propeller, concentrate the air current and give it a further acceleration inside of the stationary guide vanes so that a considerable part of the pressure is produced in the latter. A large part of



Coppus Vano Ventilator

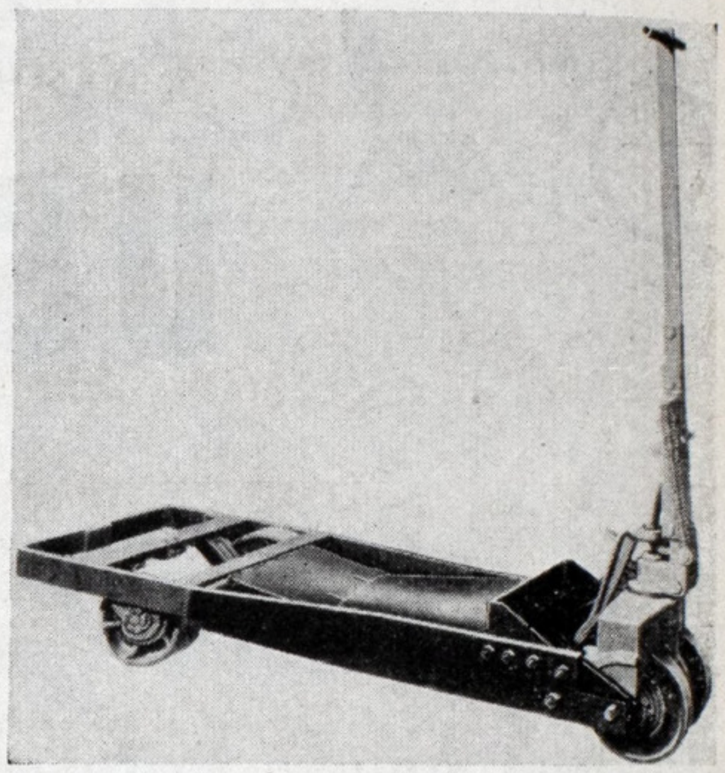
the end thrust is thus taken up by the stationary guide vane casing. The air streams, into which the flow of air has been subdivided by the guide vane blades, leave the guide vane casing, on account of the kinetic energy, slightly rotating and convergent toward the axis so that the smallest section of the air flow is reached beyond the guide vane casing.

The equipment is known as the Coppus portable vane ventilator and is manufactured by the Coppus Engineering Corp., Worcester, Mass., manufacturers of blowers and exhausters.

Lift Truck Has a Number of Safety Features

A LIFT truck has been designed and built by the Lewis-Shepard Co., Boston, Mass. The company has announced production on this unusual lift truck, designed for loads up to 3500 pounds.

This piece of lifting equipment, termed the "footlift," differs in many respects from the usual type of single stroke hand lift truck. Elevation of the load is obtained by the opera-



A Spring Handle-holdup Prevents the Handle from Falling to the Floor

tor stepping on a lever and letting his weight do the work. It is simple in construction, with all members of heavy duty materials. There are no close tolerances. Several new safety features, and a vertical release check are embodied. The lifting mechanism is still based on the successful jack principle and the truck thus becomes a team mate for the Jacklift—built by the same company.

The handle is used only for steering and hauling; a simple twist in its upright position prevents it from falling when not in use.

New Seam Compound

A NEW seam compound that is reputed to answer all the requirements of a good steam seal was recently announced by L. W. Ferdinand & Co., Boston. This new product is known as "Ferdico Seam-seal." Years of research and laboratory tests for the seam seal that would do all that a good seam seal should do, produced this new compound.

The type of compound that was sought was one that would be resilient externally, yet be tough; one that would be sticky, yet not adhere to a knife blade during application; one that would be hard on the surface so that its oils and ingredients would not bleed through paint, yet in its body would be tenacious; one that would under no conditions of climate, weather or time harden to the brittling point.

Modern Whaling Ships

(*Continued from Page 27*)

feed water tank and oil fuel double bottom to take any leakage of oil.

Three fresh water tanks of about 15,000 gallons capacity are fitted, with the necessary filling, sounding, suction and air pipes.

Eight derrick posts are fitted with 14 derricks varying from 5 tons to 30 tons.

Eight 28-foot lifeboats are carried.

A horizontal direct grip steam windlass of Clarke Chapman & Co.'s make is fitted, and the following winches and capstans are installed: Two for forward cargo hold on upper deck. Four aft end of bridge house. Six over Nos. 3 and 4 oil compartments on platform at sides of vessel. Four at fore side of aftermost derrick posts on platform at sides of vessel. One at aft end of vessel. Two warping capstans aft on upper deck. The steam winches are of the double cylinder horizontal type manufactured by Clarke Chapman & Co.

Two 40-ton steam winches are fitted on a platform for whale haulage, with two horizontal and two vertical cylinders and center lifting barrel, grooved to take 140 feet of steel wire rope in one layer.

A 15-ton winch is fitted on the upper deck at the aft end of the officers deck house. Two double purchase steam warping capstans are fitted on the upper deck aft, each having a horizontal engine. Four double purchase steam warping capstans with horizontal engine are fitted for hauling bone on the upper deck.

Other Auxiliary Equipment

A Wilson Pirrie type steering gear is fitted and there is a rudder of the single plate type. The steering gear is fitted on the rudder head under the whale slipway and is worked from the wheelhouse by telemotor control; a mechanical control being fitted on the upper deck.

Two horizontal duplex oil cargo pumps are fitted in the amidship pump room. Two horizontal duplex oil fuel pumps are fitted in the aft pump room. A ballast pump is fitted in the fore hold. A duplex drain pump is fitted in the aft and amidship cargo pump rooms with suction and discharge piping to drain pump room. A double pipe line is fitted to the oil cargo compartments with two suctions in each wing compartment and four suctions in each center compartment. Drop valves are fitted to each summer tank.

A pipe line is fitted on each side of the vessel in wing tanks in Nos. 1 to 8 tanks with one suction in each wing compartment and two suctions in each center compartment; and two lengths of flexible metallic hose with necessary couplings is carried for supplying oil fuel to whalers.

A flying bridge extends from side to side of the ship and is fitted above the navigating bridge.

Wireless telegraphy and wireless telephone apparatus with necessary instruments are installed including long wave, short wave, telephone and direction finder.

A dispensary is arranged in the bridge house; also a hospital. The vessel is electrically lighted throughout. Cold chambers subdivided into meat, vegetables and handling rooms are arranged on the second deck aft, and a steam driven refrigerating machine on the CO_2 system is installed.

Whale Rendering Plant

A slipway strongly built and efficiently stiffened is arranged at the aft end for hauling whales on board.

A blacksmiths' shop is fitted amidships on the upper deck with the necessary fires and tools. There is also a workshop on the same deck with a complete installation of machines. A carpenters' shop is arranged at the fore end of the factory deck and gunpowder houses at stern, at sides of slipway below the upper deck.

Two blubber cutters are fitted in the factory 'tween decks, each driven by a steam engine and connected to blubber pumps. The blubber is fed to the cutters by a hopper below upper deck with suitable hatch. Four steam driven bone saws, mounted on fixed bedplates are fitted on the upper deck.

Fifty-two digesters are installed on the second deck in superstructure. Of these 18 are for blubber and 34 for meat and bone.

The necessary receiving and settling tanks are also fitted, together with a suitable arrangement of piping and pumps. Four sets of Hartmann plant for oil extraction, are fitted in the factory 'tween decks, together with an installation of piping in addition to the digesters.

Eight De Laval whale oil purifiers, motor driven, are fitted in a house on the upper deck, together with the necessary tanks and piping.

The propelling machinery consists of a twin screw installation of triple expansion engines with cylinders 24¾ x 42 x 70 inches in diameter and with a stroke of 48 inches. The engines are together capable of developing 5000 indicated horsepower when running at 74 revolutions per minute, and embody the most modern features of triple expansion practice. The high pressure cylinders are fitted with separate liners and piston valves, and the intermediate cylinders are fitted with Andrews & Cameron balanced slide valves.

Reversing gears are of the all-round type, driven by a single cylinder reversing engine, and arranged so that reversing can be accomplished by steam or by hand. The turning gears are of the worm and worm-wheel type, driven by an independent reversible single cylinder steam engine, and also by hand. The air pumps are of the Edwards type fitted with Kinghorn valves. These pumps, together with the bilge pumps, are arranged to be worked from the main engines.

The condensers are of the surface condensing type, having wedge shaped body of steel plates, with flanges and facings electrically welded on, each condenser having a cooling surface of 2500 square feet.

Steam to the main engines and auxiliaries is supplied by four single ended cylindrical boilers, 17 feet in diameter by 12 feet in length, with a working pressure 200 pounds per square inch. The boilers are fitted with Howden's system of forced draft, and with Sugdens superheaters to give a superheat of 80 degrees Fahr. at the main engine stop valves. An additional single ended boiler 15 feet in diameter by 12 feet in length is supplied for whaling factory purposes. This boiler is also fitted with Howden's forced draft, but is without superheaters. All boilers are fitted with Howards steam driers, and are all arranged to burn oil fuel under Wallsend-Howden system.

During whaling operations, the five boilers are in use supplying steam to the factory.

Two 50-ton evaporators are supplied for make-up feed requirements. In addition, a complete evaporating plant is provided, capable of 150 tons in 20 hours, for whaling purposes. This plant, which is supplied by G. & J. Weir, comprises three evaporators, working separately or by triple Effet, together with large distiller and combination pumps.

Other Auxiliary Machinery

Other auxiliary machinery provided are two Clarke Chapman main feed pumps, one Clarke Chapman auxiliary feed pump, Caird & Rayner surface feed heater, two Drysdale 13-inch main circulating pumps, ballast pump, general service pump, fresh water and sanitary pumps by J. H. Carruthers. There is also an oil fuel transfer pump by G. & J. Weir.

To deal with the large amount of exhaust steam from deck, an auxiliary condenser of 2000 square feet cooling surface is provided, together with a J. H. Carruthers circulating water pump and air pump.

All of the machinery has been built under Lloyd's survey. The construction of the TAFELBERG has been carried out under the supervision of Arnesen, Christensen & Smith, naval architects and consulting engineers of Newcastle-on-Tyne, and Haakon Ingebrigtsen has represented the owner as resident inspector.

The New York State Merchant Marine academy on Jan. 6 graduated 21 young men who completed a two years' course in either deck or engine-room departments of the schoolship NEWPORT. The young men are qualified to join merchant ships as junior officers.

New Trade Publications

LIFEBOATS—A booklet on United States merchant marine lifeboat information with examination questions and answers has been published.

WELDING ACCESSORIES — Fusion Welding Corp., Chicago, in a current bulletin lists its accessories for use of the welder, including gloves, helmets, lenses, holders and other articles.

TACHOMETERS—Catalog No. 46 has been issued by the Brown Instrument Co., Philadelphia, covering its line of electric indicating and recording tachometers. Illustrations and data cover standard applications of these instruments.

MOTOR TRUCK SERVICE — The Cleveland & Buffalo Transit Co., Cleveland, has issued a booklet on its motor truck service between Cleveland and Buffalo during the season of closed navigation. The new service is on a par with the summer service, rates remaining the same.

PULVERIZER—The new Type B pulverizer is described and illustrated in Bulletin 5-80 recently issued by the Fuller Lehigh Co., Fullerton, Pa.

The bulletin is well illustrated and describes in detail the construction and operation of the mill. Outstanding features include the spherical-ball and grinding ring principle and the enclosure of all parts requiring lubrication in dust-and-oil tight housings. Copies of the bulletin are available upon request.

POWER PUMPS—Vertical triplex power pumps are illustrated and described in a current bulletin by the Worthington Pump & Machinery Corp., 2 Park avenue, New York. Various types are illustrated and details are shown. Size and data tables are included.

RADIO—The Radio Corporation of America, New York, has issued a book on the development of the radio during the decade of 1920 to 1930. The book begins with historical data followed by chapters on marine radio, communications, sound pictures, research, engineering and manufacturing, R.C.A. institutes, broadcasting, and entertainment and cultural center.

INDUSTRIAL GERMANY — The tenth annual issue of its handbook on industrial and commercial Germany has been prepared for distribution by the Hamburg-American Line, 39 Broadway, New York. It contains a survey of Germany's economic position and a series of articles by experts dealing with the principal branches of industry. A list of fairs and expositions in Germany is given.

MOTORSHIPS—Under the title of *The Modern Trend in Merchant Ships* the Busch-Sulzer Bros.-Diesel Engine Co., St. Louis, has issued a handsome book giving an address delivered by its president, Edward B. Pollister, on the subject. The book is replete with information on the development of the diesel engine and is handsomely illustrated with various types of motorships.

ELECTRICAL DEVICES — General Electric Co., Schenectady, N. Y., has issued a number of bulletins on various products; hand starting compensators for squirrel-cage induction motors; magnetic switch; automatic full-voltage controllers; oil circuit breakers; resistor arc welders; fan-cooled induction motors; explosion chambers; automatic switchgear.

SPROCKETS—A book prepared by the Link-Belt Co., Chicago, No. 1267, is devoted to sprockets. It contains specifications of sprockets stocked in all standard sizes for immediate delivery. Boring to shaft diameter is the only operation necessary before shipment. The plan of stocking sprockets has been worked out to minimize delay from breakdowns of conveying machinery.

STEAM GENERATING EQUIPMENT —A revised edition of its general condensed catalog of fuel burning and steam generating equipment, GC-6, has been issued by the Combustion Engineering Corp., New York. It illustrates and briefly describes this class of equipment as supplied by this company. A complete list of products by the Combustion Engineering Corp. is appended.

Business News for the Marine Trade

The Pere Marquette Railway Co., Ludington, Mich., will completely rebuild No. 2 car-ferry slip at a cost of $200,000.

The diesel oil tankers T. J. Conway, Ira S. Bushey and M. J. Derby, North Hempstead, L. I., have been incorporated by Foley & Martin, 64 Wall street, New York; 1,000 shares common, each.

The city of Baltimore, Charles F. Goob chief engineer, has started construction of an airport and seaplane base; estimated cost, $4,000,000. William F. Broening is mayor.

The Great Lakes Coal & Dock Co., 228 Plymouth building, Minneapolis, contemplates the erection of a new coal dock at Allouez bay, Superior, Wis. Work probably will start next spring. William Nelson is general manager.

The Canton Co., Canton House, Baltimore, has awarded contract to Sanford & Brooks Co., Canton House, for a two-story pier, freight and passenger shed at Pier 10. Cost is estimated at $500,000. Baltimore-Hamburg Co. is lessee.

A passenger and freight steamer service between Corpus Christi, Tex. and Mexican Gulf of Mexico ports will be established about Jan. 20 by the Boyd Campbell Steamship Co., Texas City, Tex.

The Warrior River Terminal Co. has asked permission of the interstate commerce commission to issue $1,150,000 in capital stock to be paid to the Inland Waterways Corp. Both companies are government-owned.

Curtiss Wright Flying Service, Alameda airport, Alameda. Cal., plans to build seaplane repair shops and other facilities at the yacht harbor recently completed at a cost of $180,000. Harbor is 600 feet wide and 2000 feet long.

Seawood Corp., 16 West Sixty-first street, New York, plans to build a plant at South River, N. J., for the construction of yachts. Unit will be located on the South river at William street. Cost is estimated at $40,000.

Alaska Washington Airways Inc., Seattle, is building a floating seaplane terminal at Seattle.

Tampa Shipbuilding & Engineering Co., South Water street, Tampa, Fla., is planning to build a floating drydock and to install repair facilities. Plans are being prepared. W. T. Donnelly, 247 Park avenue, New York, is engineer. Maturity about Jan. 1.

The city commission of Trenton, N. J. will soon call for bids on the construction of a marine terminal along the Delaware river, South Trenton. Approximate cost will be $450,000. The architect for the work has not been selected.

Bids have been asked by the City of Long Island, A. Goldman, commissioner plant and structures, Municipal building, New York, on a ferry terminal, including steel buildings, steel towers, ferry bridges, machinery and electrical apparatus, foot of Astoria avenue.

The Curtis Bay Towing Co., Baltimore, has purchased the lighterage and towing business and equipment of Capt. William J. Donaldson, Philadelphia, and has incorporated the new holdings under the name of Donaldson Towing & Lighterage Co. Operation on the Delaware river and bay is planned.

Manufacturing operations of the Fuller Lehigh Co. are to be transferred from Fullerton, Pa. to the Barberton, O. works of the Babcock & Wilcox Co. Management, engineering and sales departments will move to New York. No definite date has been set for these changes but it is expected that they will be made early in 1931. The corporate identity of the Fuller Lehigh Co. will be maintained but in some cases the personnel will be merged with that of the parent company, the Babcock & Wilcox Co. E. G. Bailey, president of the Fuller Lehigh Co. has been elected a vice president of the Babcock & Wilcox Co.

The Mohair institute, 7 South Dearborn street, Chicago, was recently established to further the interests of the American mohair industry, which has experienced a tremendous growth since the World war. A. G. Gage, an international authority on mohair, will act as director. Special attention will be given to the uses of this textile in the marine field. Nearly 20,000 yards of mohair velvet were used in fitting up the LEVIATHAN.

The Baltimore-New York Steamship Co., 1335 Baltimore Trust building, Baltimore, has been incorporated by Frederic Weiss, Charles B. Hoffman and William A. Grimes, all of Baltimore, under the laws of Maryland to engage in a general transportation business. The capital stock consists of 1000 shares of common, no par value. Operations began on Jan. 9 when the steamer COMANCHE recently reconditioned, sailed from Baltimore to New York. Two sailings per week are planned. The line will be operated by the Weiss Motor Co.

Plans for alterations and additions at the South Philadelphia works of the Westinghouse Electric & Mfg. Co., which have been contemplated for some time, will be put through immediately. In addition to facilities for the manufacture of marine machinery and the steam equipment of large electric generating plants, part of the manufacturing space of the South Philadelphia works will be converted into a locomotive equipping shop. About six months will be required to complete the work, which will cost in excess of $300,000.

Marine Review

Reg. U.S. Pat. Off.

The National Publication Covering the Business of Transportation by Water

February, 1931

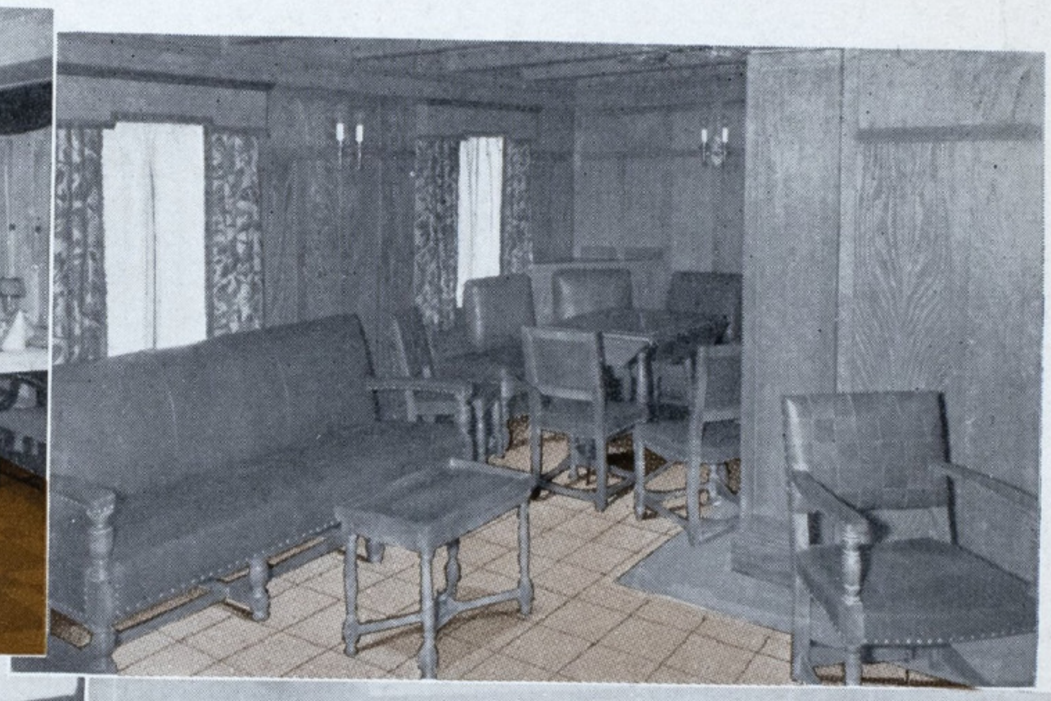
DECK COVERINGS ON THE FOUR NEW EXPORT LINERS

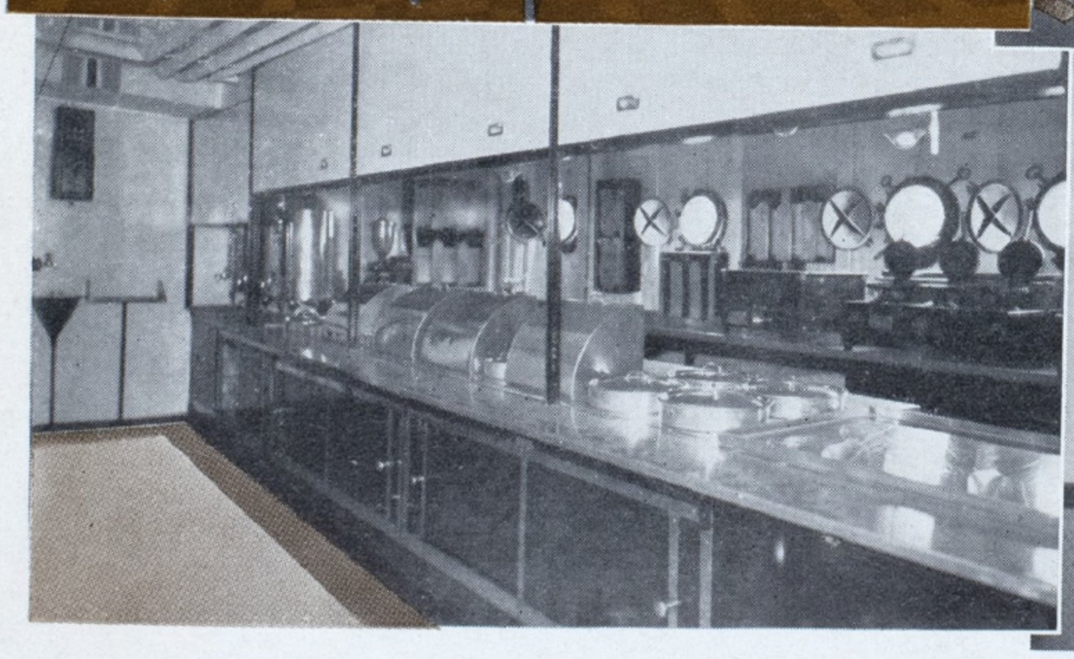
Excalibur
Exochorda

Excambion
Exeter

Geo. G. Sharp—Naval Architect

New York Shipbuilding Co.—Builders





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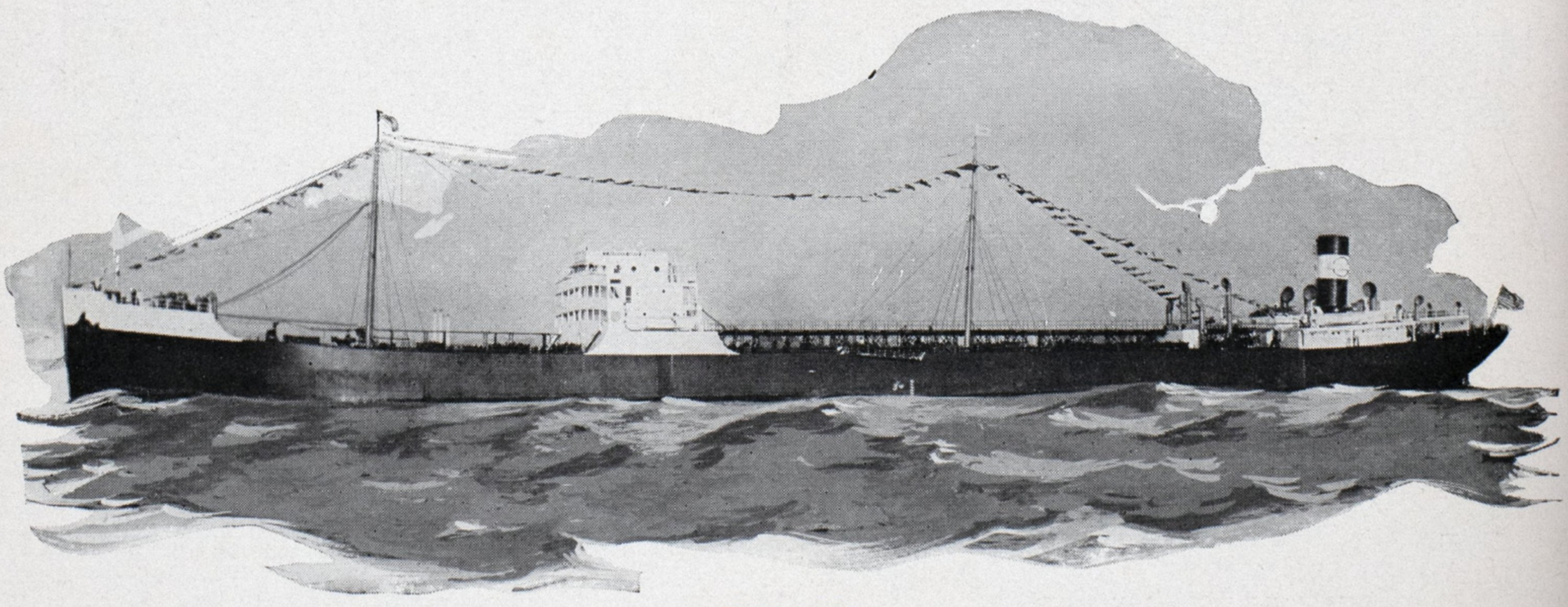
G. Harrison Smith
Uses Modern Steam

The *G. Harrison Smith*, latest and most efficient of all tankers uses Modern Steam at 400 lbs. per square inch and a total temperature of 750°F.

The boiler fuel consumption of this vessel is exceptionally low . . . so low that the *cost for fuel is by far the lowest per shaft horse power per hour of any tanker afloat today.*

The *G. Harrison Smith* is equipped with Babcock & Wilcox Water Tube Boilers, Superheaters, Air Preheaters, Feed Water Regulators and B. & W. No. 80 Firebrick. Babcock & Wilcox Desuperheaters provide dry steam for the auxiliaries.

Water Tube Boilers . . . Oil Burners . . . Economizers . . . Stokers
Air Preheaters . . . Oil Separators . . . Superheaters . . . Refractories



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Winter Towing is no hardship for Columbian Tow-Ro. The constant immersing in the ice cold water or using it under winter's most severe conditions will not harm Tow-Ro nor alter its effectiveness. It will give the same dependable service the coldest day in winter that it gives the hottest summer day. Compare these additional features with any other towing line:

It is waterproofed and is flexible wet or dry.
Its new patented construction gives it excessive strength and durability.
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Try Columbian Tow-Ro when you buy tow lines, spring lines, etc. You will be gratified at its performance.

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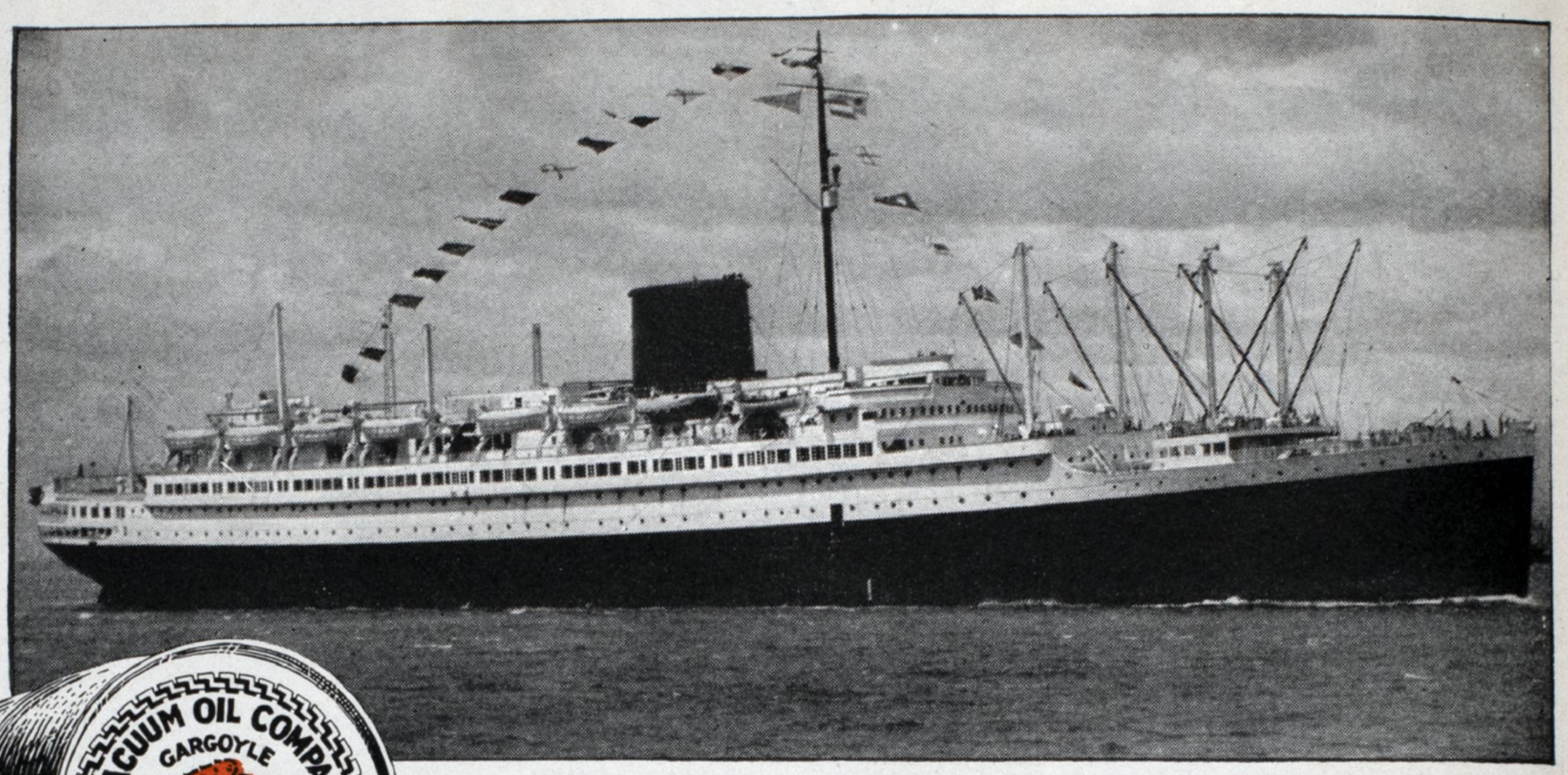


M. S. *Lafayette*, latest addition to the French Line's fleet of popular liners. She is the flagship of the cabin class fleet.

Lafayette's four power units protected with

Gargoyle Marine Oils

M. S. *Lafayette*, luxurious new French motorliner, is just completing ten months of highly satisfactory service on the New York-Havre run.

As in other noted French Liners—*France*, *Paris*, *De Grasse*, *Ile de France*—Gargoyle Marine Oils insure efficient and economical operation in the engine room.

The experience of French Line engineers with these high-quality lubricants parallels that of hundreds of other Marine engine experts throughout the shipping world. Years of consistent use prove that Gargoyle Marine Oils:

furnish the best insurance against untimely breakdowns and costly repairs;

conserve power by reducing friction to a minimum;

reduce fuel and oil consumption;

lengthen the life of propelling machinery.

Stocked and sold in more than 300 of the world's leading ports, Gargoyle Marine Oils are readily available wherever you put in. The Vacuum Oil Company representative in any of these ports will be glad to recommend and supply the correct grade for use in your type of power plant.

NOTE: We will be glad to send you, without obligation, either of our authoritative books on Marine Lubrication: "Steamships with Reciprocating Engines," "Marine Lubrication—Motorships." Address your request to: Vacuum Oil Company, Marine Sales Dept. D-2, 61 Broadway, New York City.

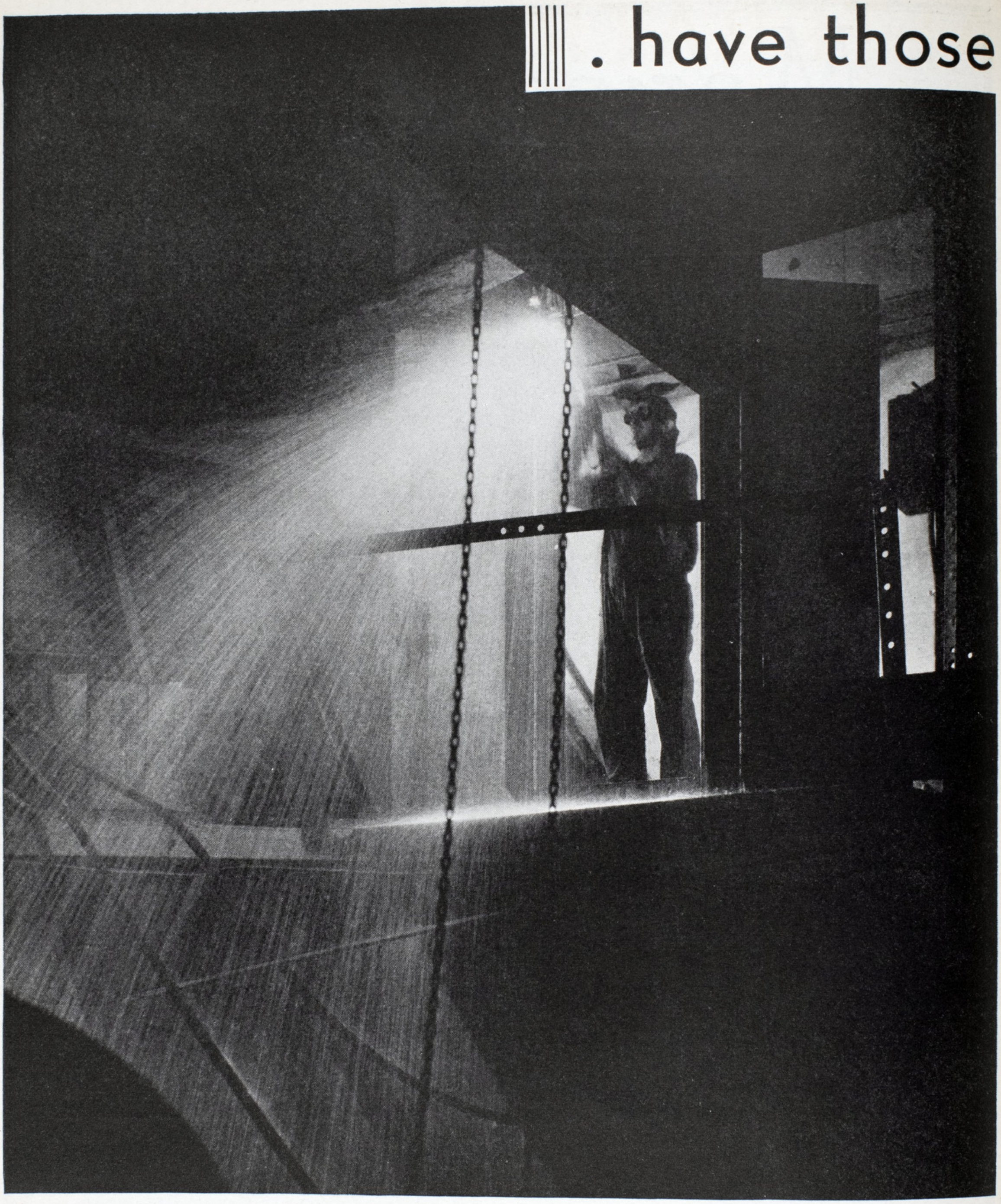
GARGOYLE

Marine Oils

A grade for every type of service

Vacuum Oil Company — *Specialists in the manufacture of high-grade lubricants for every class of machinery Obtainable everywhere in the world* — *New York, U.S.A.*

. have those



The AMERICAN

CLEVELAND
American Ship Building Co.

LORAIN
American Ship Building Co.

BUFFALO
Buffalo Dry Dock Company

ALTERATIONS and IMPROVEMENTS made NOW . . . . .

WE don't believe that business conditions can be fundamentally improved by "Pollyanna" talk. Much more effective is the letting of a few large contracts in basic industries.

For example, if all the leaders of industry should decide to have needed work done now instead of a few months later; to put into effect *now* ideas for improvements and alterations already clearly in mind, the wheels of industry would soon begin to speed up.

If all the vessel owners and operators who know now exactly what changes they should have made in their equipment to increase efficiency and boost earning capacity should have this work done *now* it would start things moving in the ship industry.

But more than that, they would get the work done for *less*, for now material costs are lower and now labor is more efficient.

Business will eventually start up—but why wait?

American Ship is ready to serve the Lake shipping industry with five yards advantageously located for economical and dependable service.

SHIP BUILDING Co

SOUTH CHICAGO
Chicago Ship Building Co.

SUPERIOR
Superior Shipbuilding Co.

AMERICAN SHIPS . . .
Harbingers of Prosperity

Keel-Laying of the Largest and Highest
Powered American-Built Passenger Liner
at the Yard of the
New York Shipbuilding Company,
Dec. 6, 1930.

ALL forward-looking citizens recognize the benefits of having American ships built of American material, in American shipyards, manned by Americans, paying the American wage scale, transporting passengers and carrying the products of American labor, whether from farm or factory, to every part of the world.

Eighty percent of the cost of a ship in this country goes for wages. Nearly every State in the Union contributes something in the way of materials or equipment, and almost every industry will furnish one or the other.

Each time American patronage inspires the American shipping industry to build a new ship it puts sound money in circulation in a most wholesome and continuing way—and this is the basis of prosperity.

•

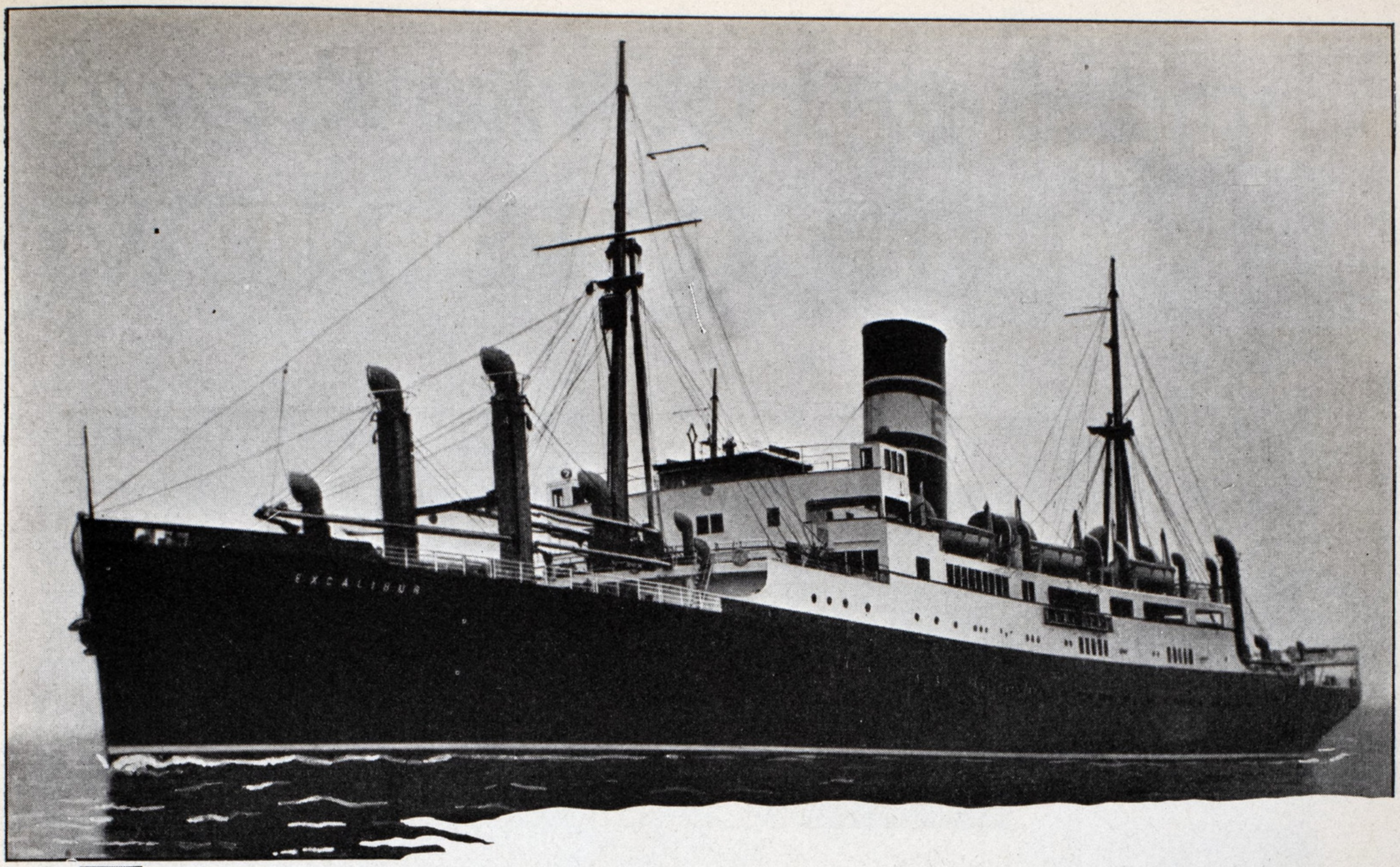
Patronize American Shipping Lines

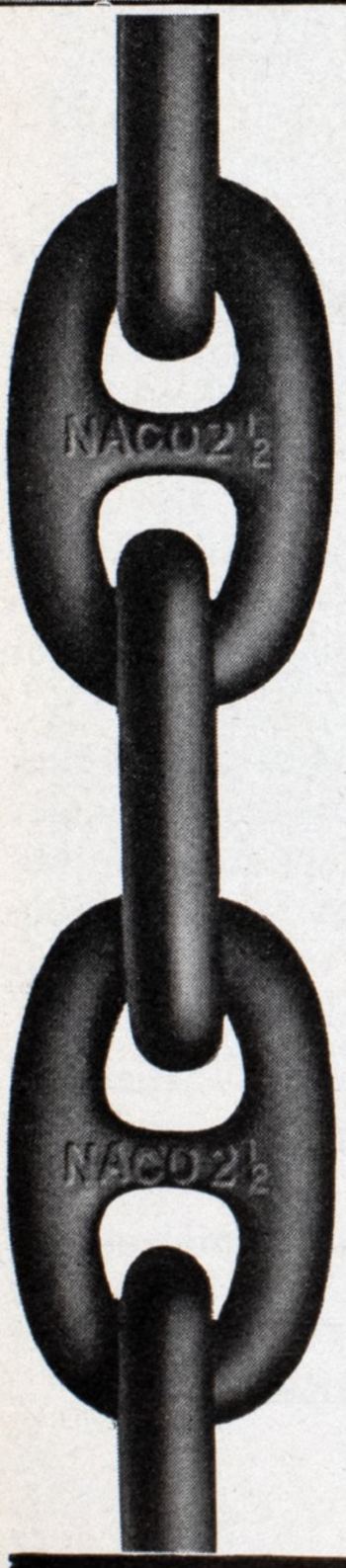
•

NEW YORK SHIPBUILDING CO.

Main Office and Works:
CAMDEN, N. J.

New York Office:
420 LEXINGTON AVE.





"NACO"

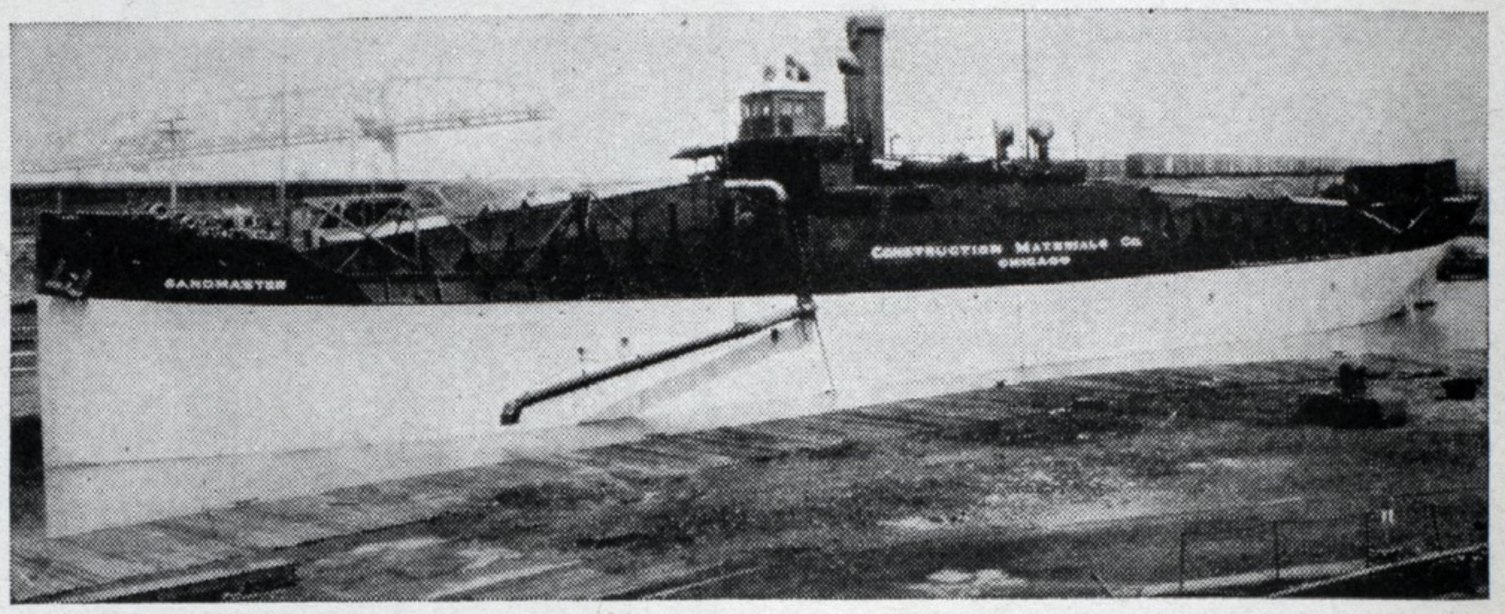
The only anchor chain made with the link and stud **"one solid piece"** was chosen to safeguard the new S.S. Excalibur, which was just put in service, and the three sister ships Excambion, Exeber, and Exochordo now building for the Export Steamship Corporation.

300 fathoms of 2½ inch NACO Anchor Chain carried on each of these ships gives advantages offered by no other commercial chain.

NATIONAL MALLEABLE AND STEEL CASTINGS CO.
General Office—Cleveland, O.

NACO CAST STEEL CHAIN
The Strongest Chain Made
TRADE MARK

12-*to*-1 *Service Record* FOR THE NEW



At right, the "SANDMASTER"; *on adjoining page, the* "J. R. SENSIBAR," *owned and operated by the Construction Materials Company, Chicago, Ill. Lignum-vitae bearings on the* "SANDMASTER" *gave only four to six months' service. Goodrich Cutless Bearings, installed in 1927, are still in service.*

STILL on the job after four years, where other bearings had lasted four months at most! A remarkable record in any waters. Startling when you consider that the Goodrich Cutless Bearings installed in 1927 on the "SANDMASTER" have for four years been lubricated by the sandy, gritty water churned up during dredging operations.

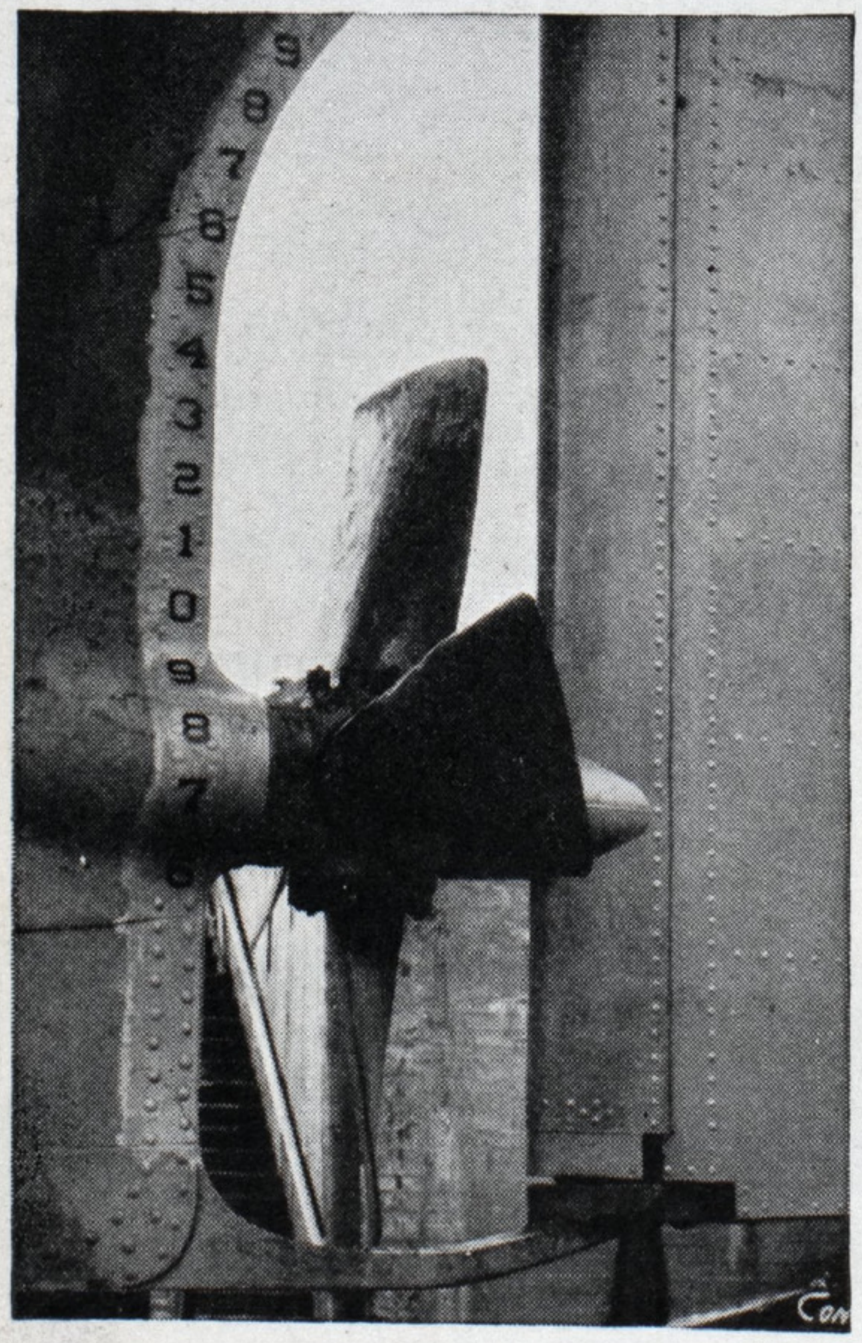
And now the owners of the "SANDMASTER" choose the Goodrich Cutless Bearing for a second "sand sucker," the "J. R. SENSIBAR," largest hopper dredge on the Great Lakes.

Made of specially compounded soft rubber... lubricated by the water in which it runs, the Goodrich Cutless Bearing is the only type ever proved satisfactory in waters where sand and grit are present. Abrasive particles entering between the propeller shaft and the bearing are rolled on the soft rubber of the bearing into specially designed grooves and then washed right out by the lubricating water stream. No scoring or cutting of either shaft or bearing.

The very same characteristics that give these bearings longer life under peculiarly severe operating conditions naturally tend to insure truly remarkable service under conditions more nearly normal.

Our consulting staff will assist you, if you wish, in preparing your bearing specifications.

Would you like further information about Goodrich Cutless Bearings? Write to The B. F. Goodrich Rubber Co. (Est. 1870), Akron, Ohio.

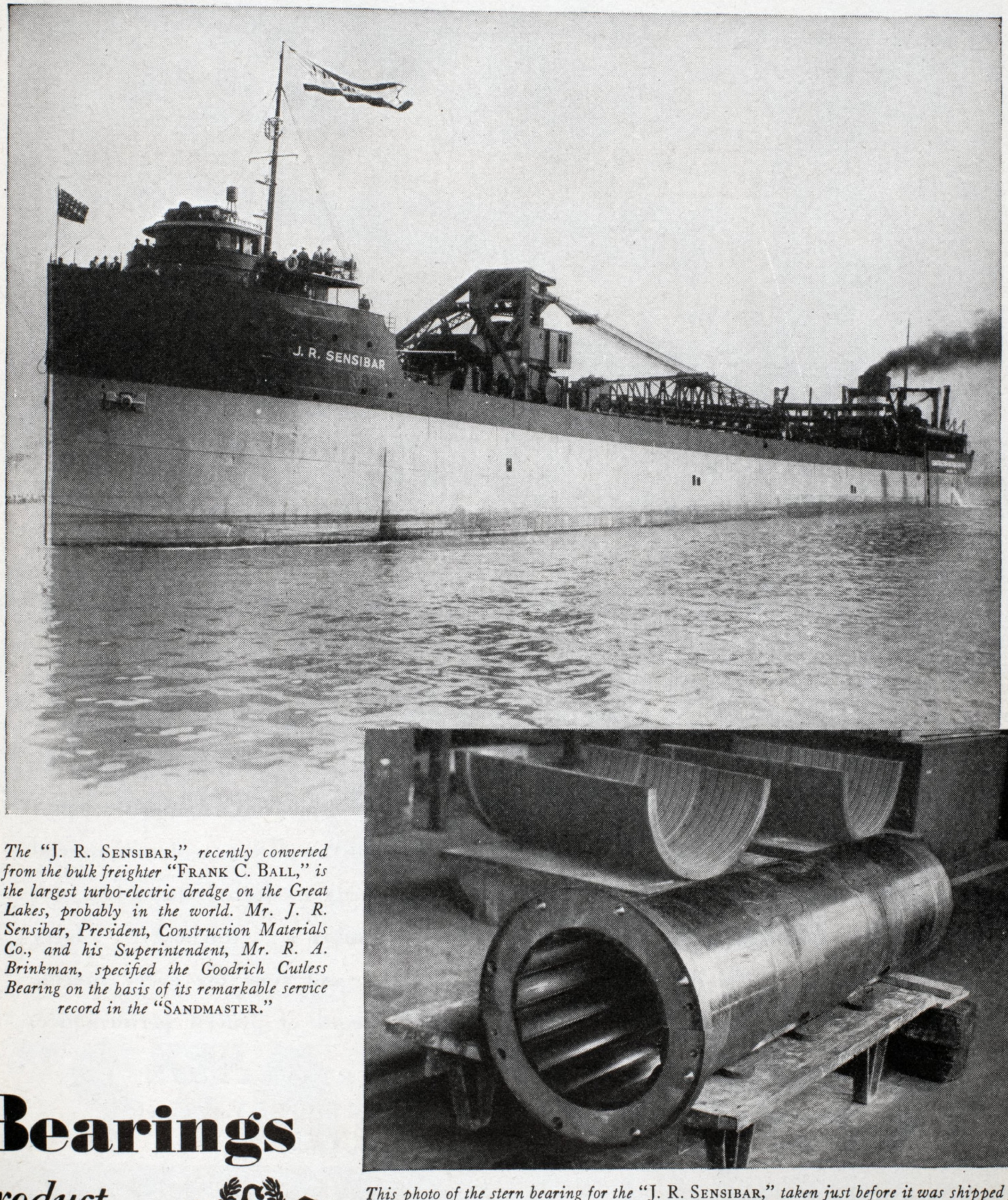


Oertz Stream Line Rudder and Special Propeller, installed on the "J. R. SENSIBAR." *Propeller weighs approximately 6 tons and is driven by 3000 h.p. General Electric propulsion machinery, through 15" diameter propeller shaft carried in a Goodrich Cutless Stern Bearing.*

Goodrich *Cutless*

Another B. F. Goodrich

Determines Bearing Choice
"J. R. SENSIBAR"



The "J. R. SENSIBAR," *recently converted from the bulk freighter* "FRANK C. BALL," *is the largest turbo-electric dredge on the Great Lakes, probably in the world. Mr. J. R. Sensibar, President, Construction Materials Co., and his Superintendent, Mr. R. A. Brinkman, specified the Goodrich Cutless Bearing on the basis of its remarkable service record in the* "SANDMASTER."

Bearings

Product

This photo of the stern bearing for the "J. R. SENSIBAR," *taken just before it was shipped from the Goodrich factory, shows clearly the design of the rubber surface. It is easy to see how it permits the propeller shaft to spin freely and how particles of sand or grit are washed away without damage to bearing or shaft.*

Reliability . . .

in the emergency as at routine tasks

WORKING HOUR AFTER HOUR at their daily routine tasks—"carrying-on" unhesitatingly in the emergency—Cooper-Bessemer Diesel engines have justly earned their reputation for unfaltering reliability. • This reliability in the emergency, plus the dependable, economical performance at its daily task, is typical of Cooper-Bessemer Diesels, and has earned for them an enviable reputation in all types of commercial marine service. It will pay you to investigate these sturdy modern engines for your marine service, whether fishing vessel . . . tug . . . tanker . . . towboat . . . ferry . . . cargo vessel . . . dredge or yacht. There is a size and type for every marine need . . . and back of each stands an unsurpassed record of proven performance.

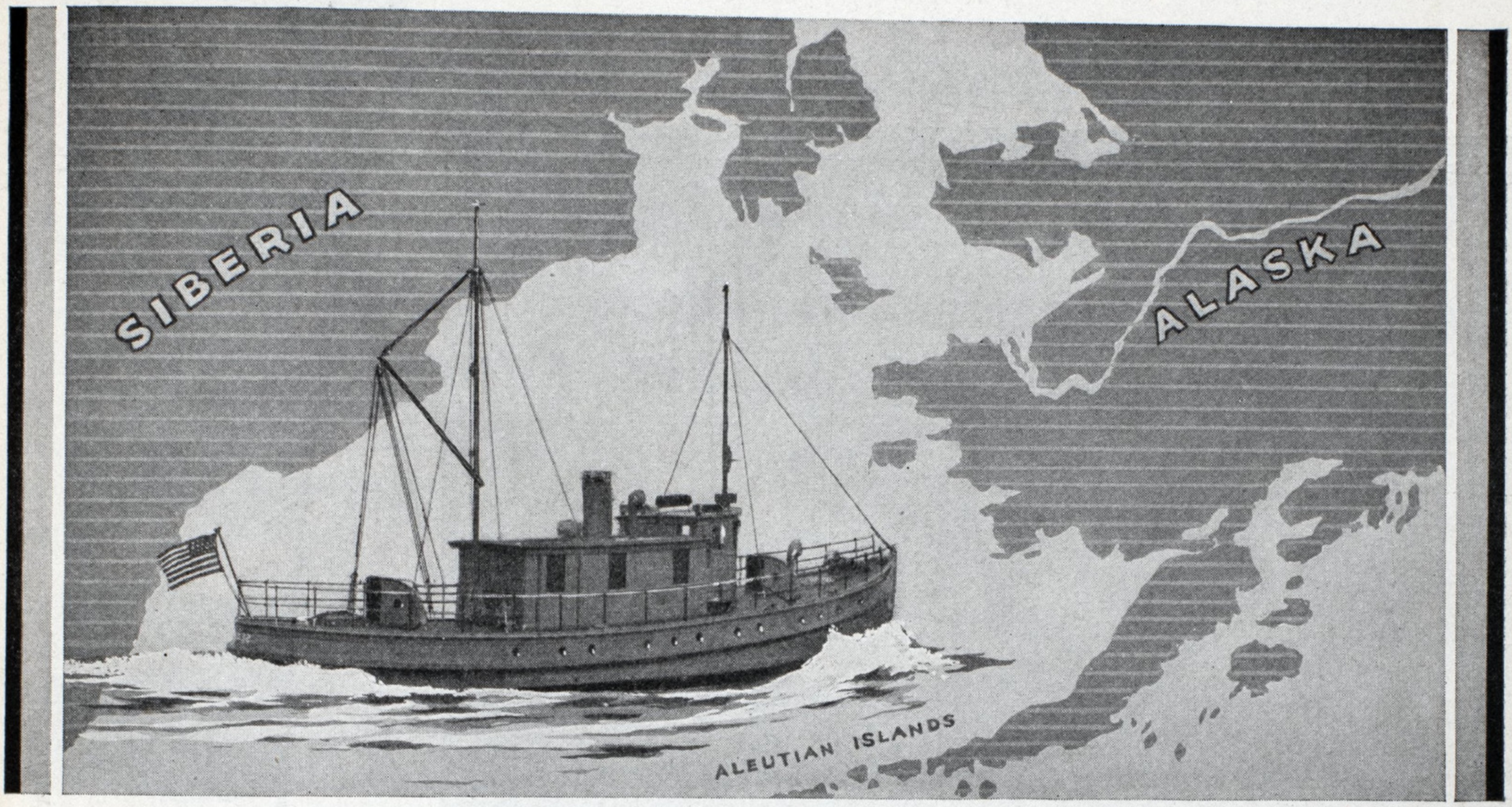
THE COOPER-BESSEMER CORPORATION

General Diesel Sales Offices: Suite 301, 25 W. 43rd St., New York City

Plants: Grove City, Pa.—Mt. Vernon, Ohio

COOPER-BESSEMER DIESELS

After
50,510 miles in Arctic waters
there's no guessing about an engine



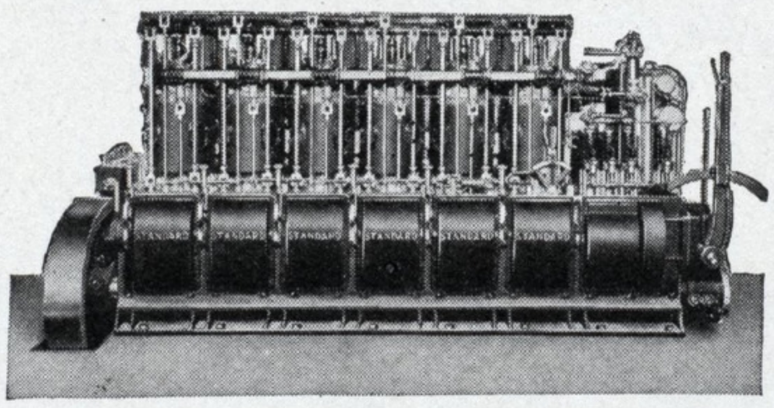
A test like that leaves facts, stark naked facts, standing alone. Opinions don't count. Personal prejudices are cast aside.

There is the case of the "Seal" for instance. The "Seal" is a Diesel patrol boat used by the Alaska Game Commission, carrying game wardens to outlying parts of Alaska, enforcing the fur and game laws. She is 68 feet long, 15½ foot beam, powered by a Standard Diesel Engine.

The "Seal" has been in commission four years, during all seasons, facing a furious variety of weather conditions. She has covered 50,510 nautical miles in a total running time of 5,238 hours, or at an average speed of approximately 9.6 knots per hour.

The engine is operating with its original set of cylinders. A recent overhauling of the engine revealed the amazing fact that *the cylinder walls have worn less than six-thousandths of an inch.*

The unfailing sturdiness of the Standard Diesel Engine is not a claim — it is a fact. The Standard is a light, compact, accessible, POWERFUL engine. Write for descriptive literature and quotations on your specific requirements.



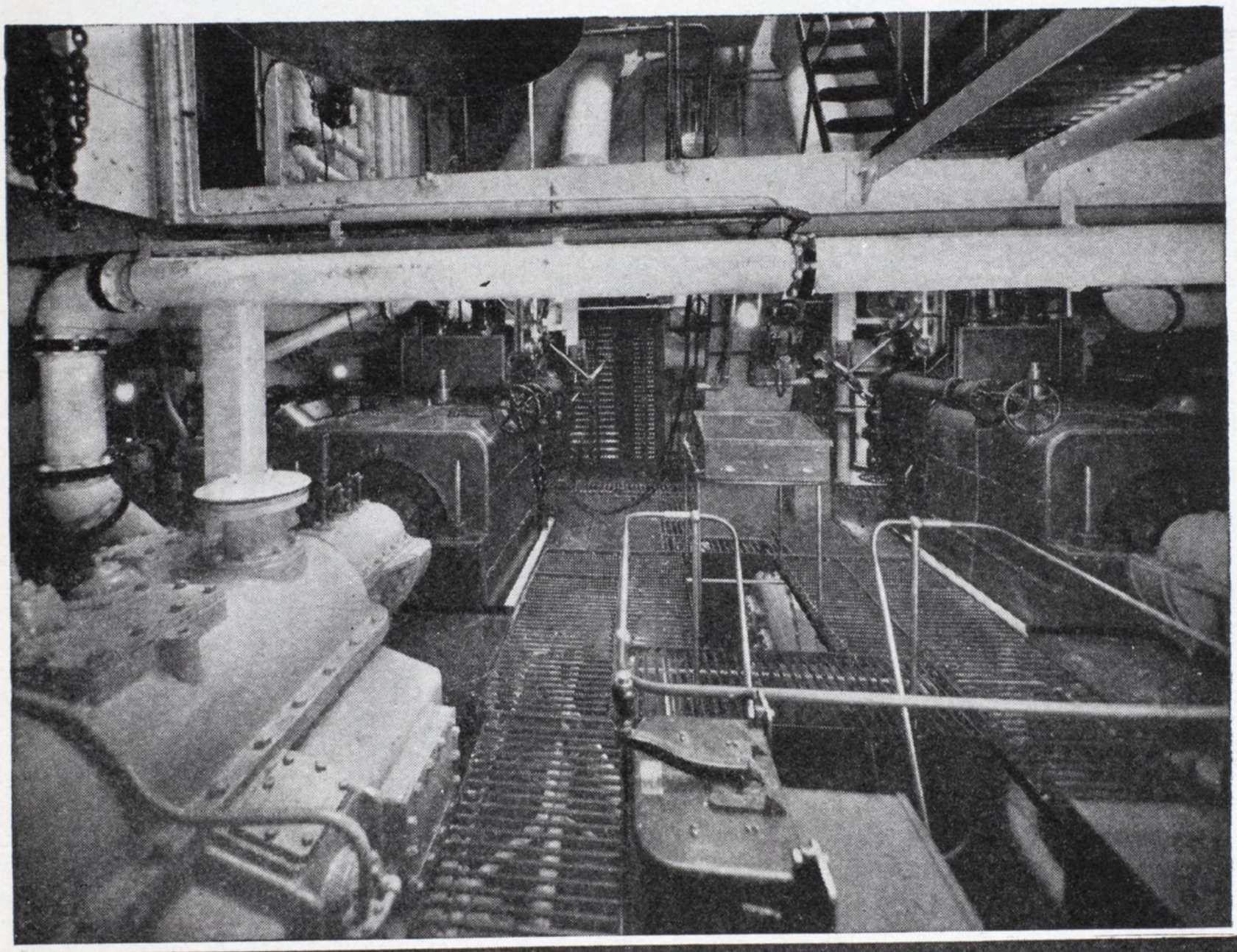
The Standard Diesel line includes 3, 4, 6 and 8 cylinder full Diesel engines ranging from 50 to 500 H. P. All models direct-reversible, even 3 and 4 cylinder engines, and all capable of ample overload capacity. Standard has several new sizes of engines.

STANDARD MOTOR CONSTRUCTION CO.
184 Whiton St., Jersey City, N. J.

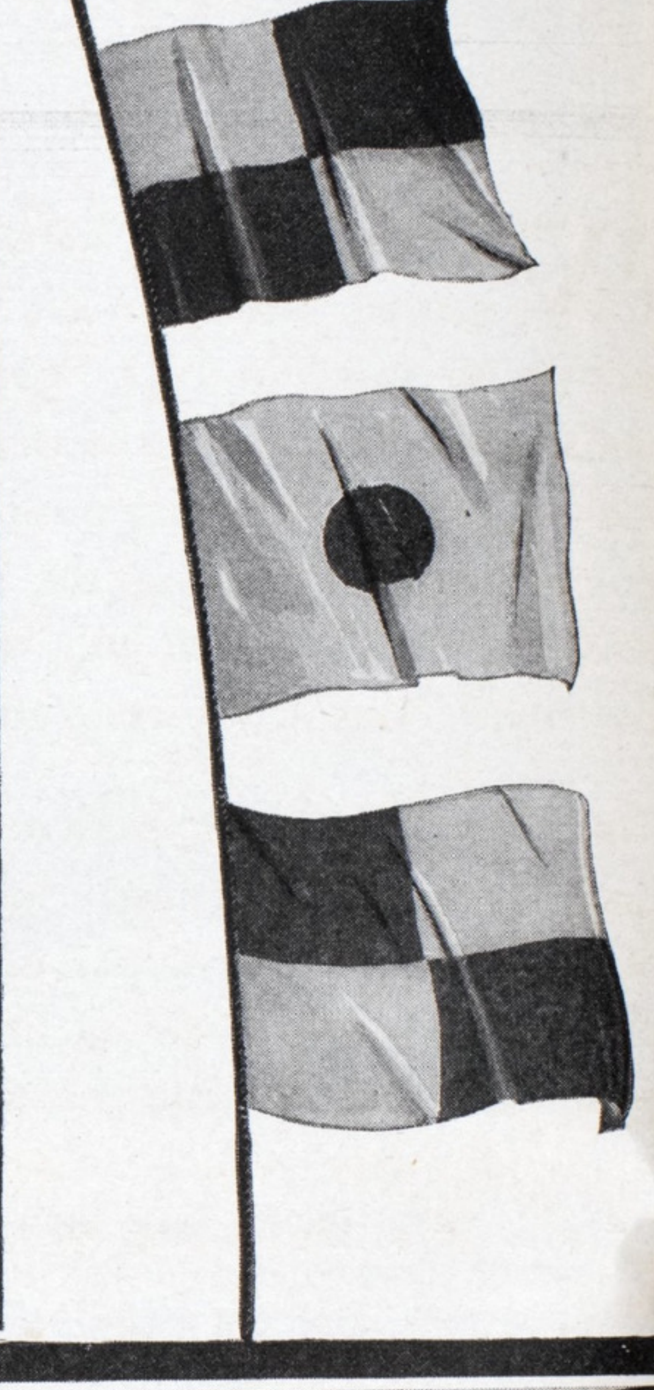
A few good territories open for active representatives

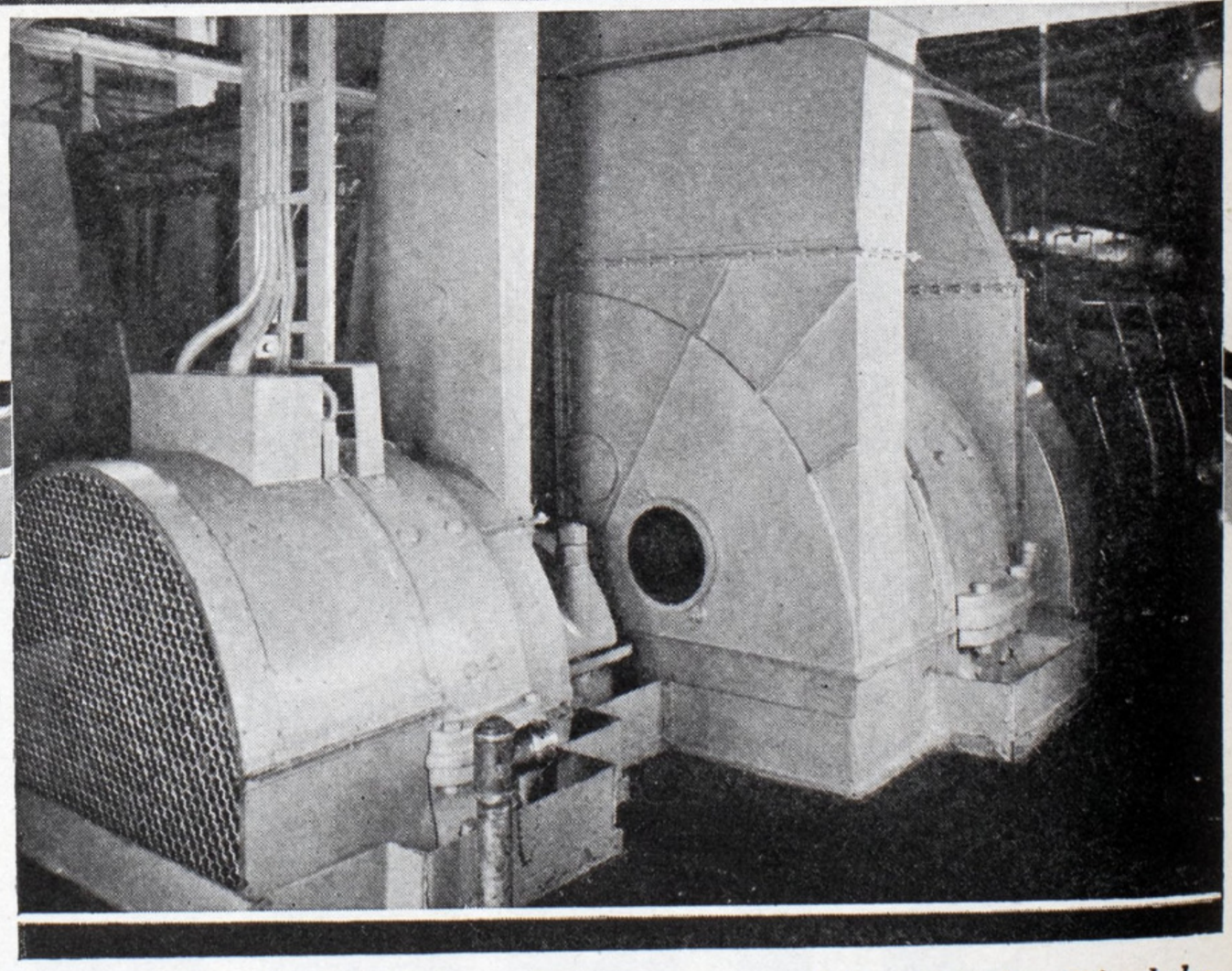
"STANDARD" DIESEL ENGINE

MAINTAINING



The engine room of the steamship Waialeale showing the two Westinghouse marine geared turbines which total 4,000 s.h.p. Westinghouse also supplied the complete condensing equipment. Through many years of service in the Navy and Merchant Marine, Westinghouse marine geared turbines have definitely established their economy and reliability.

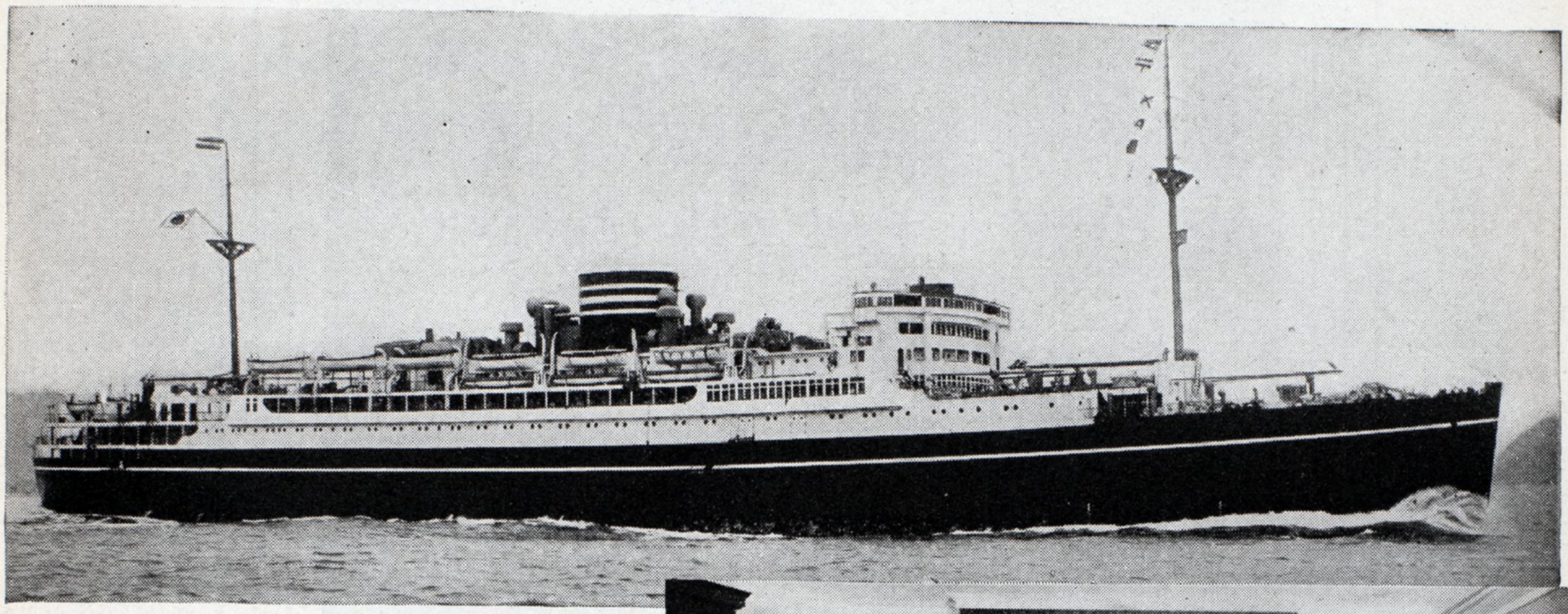


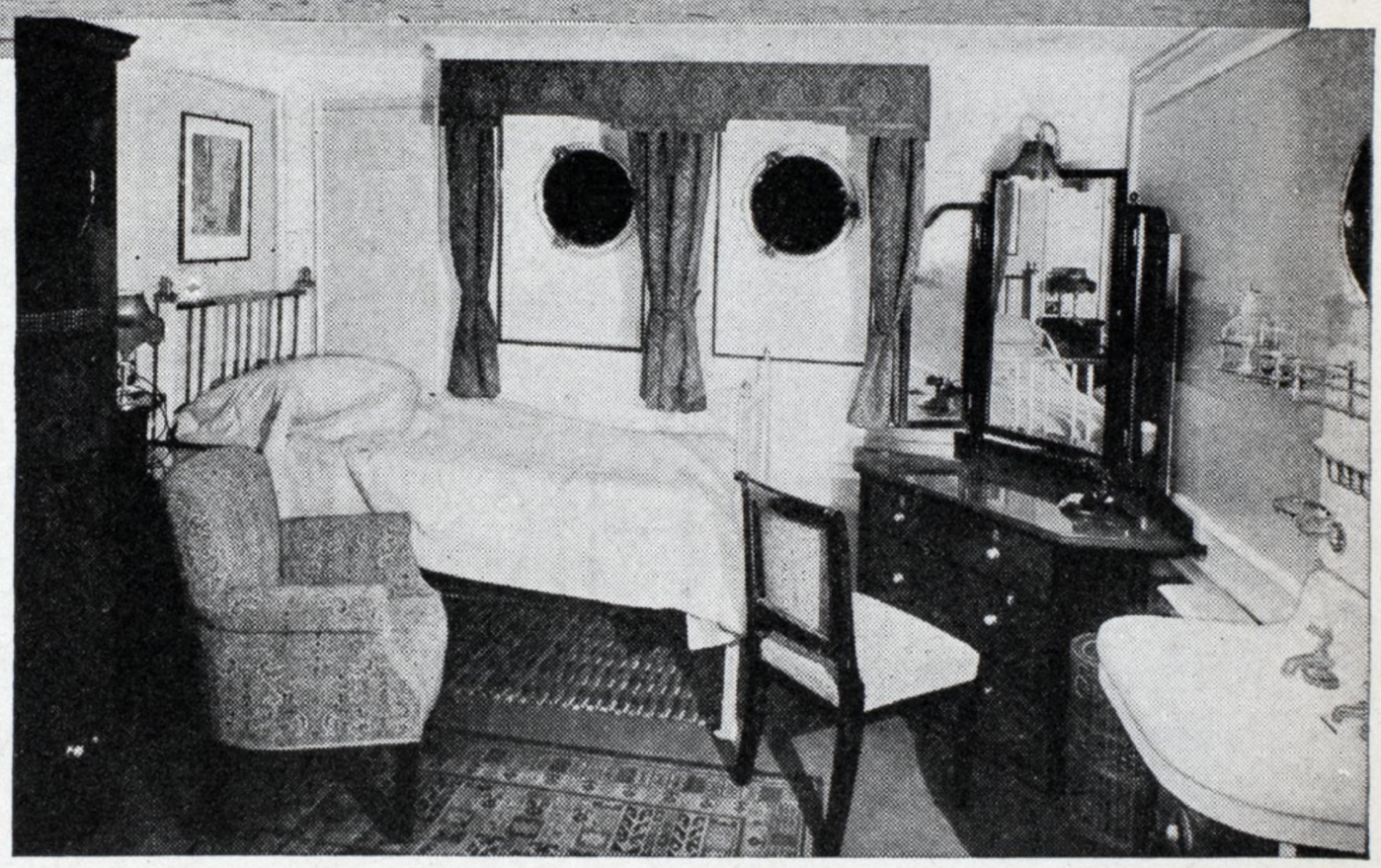


One of the four main Diesel engine generator units of the 4,000 s.h.p. Diesel electric freighter Defiance. Westinghouse Diesel electric propulsion is in service today in many classes of vessels including tankers, cargo carriers, tugs, fireboats, yachts and ferries.

In the race for public favor . . .

they choose this famous equipment





A typical stateroom equipped with Simmons Beautyrest Mattresses

The palatial new Chichibu Maru selects Simmons Beautyrest Mattresses

"SECOND OF THE THREE" new motor ships ordered by the N. Y. K. Line, the Chichibu Maru is a triumph of modern construction and comfort. Spacious public rooms, Roman pool, banking service, picture gallery . . . smooth, flowing power from twin Diesel engines . . . marvelous charm of decoration.

Simmons Beautyrest Mattresses were chosen for the capacious first cabins of this new liner. Comfortable as the beds in an exclusive hotel—or their own homes—passengers have been quick to praise the luxury of these "inner construction" mattresses.

Prestige is gained and maintenance costs are reduced when Simmons equipment is installed . . . for comfort and beauty are happily combined with marvelous durability.

We will help you prepare estimates, if you wish. Write to The Simmons Company, Contract Division, 222 North Bank Drive, Chicago, Illinois.

SIMMONS

BEDS • SPRINGS • MATTRESSES • METAL FURNITURE • AND BERKEY & GAY FURNITURE

Machine shop at Rivard Street, Detroit where we build and repair engines

HIGHEST STANDARDS

of workmanship, engineering and service are ever apparent in Great Lakes built ships and engines—and repairs.

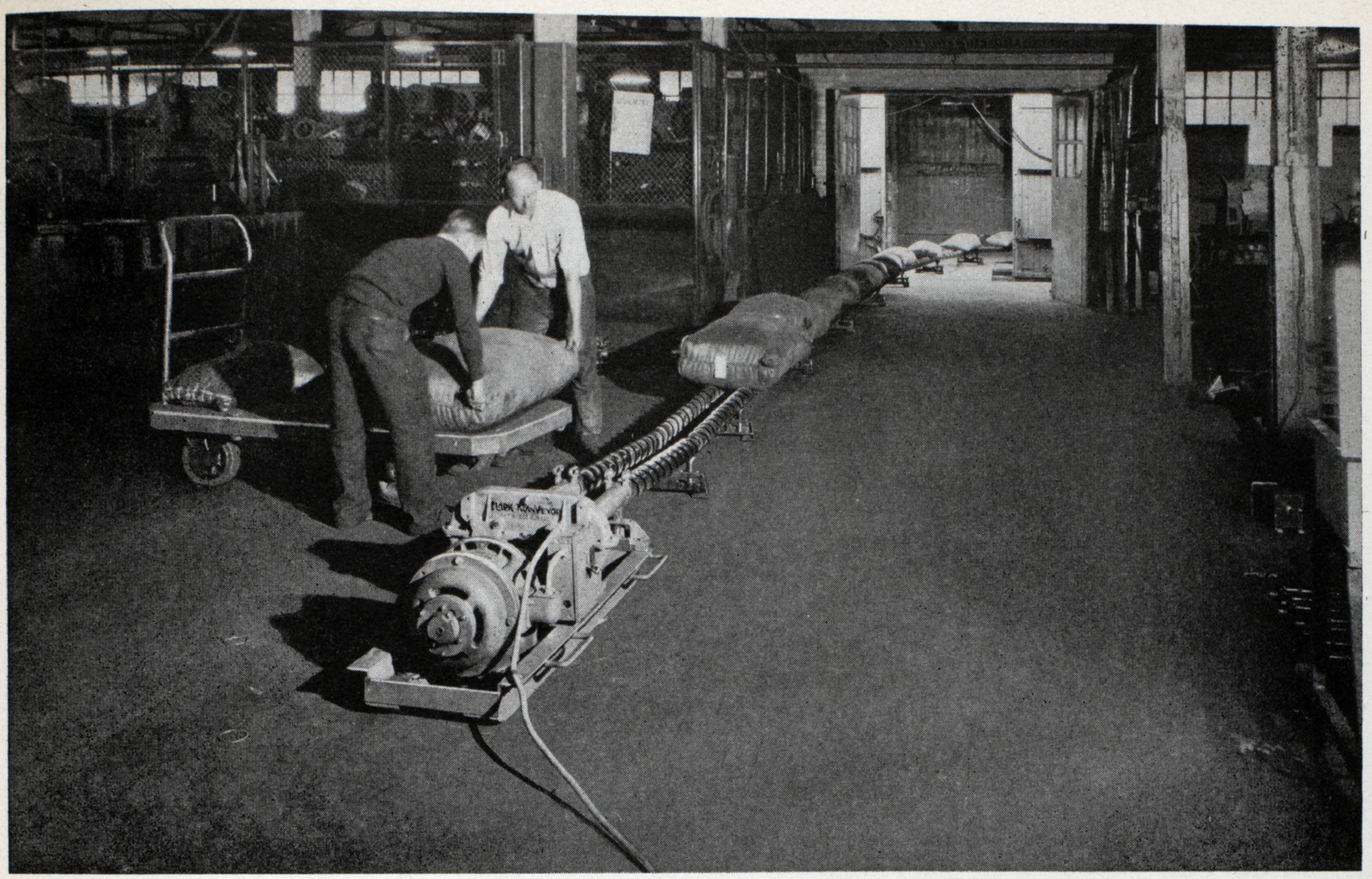
GREAT LAKES ENGINEERING WORKS

Shipbuilders and Engineers

Engine Works Equipped For General Heavy Machine and Foundry Work
Detroit, Michigan

General Offices
River Rouge, Michigan
Cleveland Office: Union Trust Bldg.

Complete Shipbuilding Dry Dock and Repair Facilities
River Rouge, Mich., and Ashtabula, Ohio



Bagged sugar, "TwinVeyed" at an Eastern terminal is tiered by "TwinVeyor" at a cost of 5c per ton as against 18c when the job was done by hand.

"TwinVey"

—the gentle art of quick conveying

with

CLARK TWINVEYOR

And that's important to ship owners. A ship earns money at sea. Not at the wharf. Increased "port speed" —meaning faster cargo handling—is good for dividends.

Clark "TwinVeyor" offers ship operators the first portable, flexible conveyor suited to their use. It is sectional. Easily moved about, hooked up in various assemblies between decks and on docks. Conveys cargo in bags, bales, bundles, boxes, crates, cartons—swiftly, silently, economically. It elevates. It tiers.

With "TwinVeyed" cargo, fewer ships required to move a given tonnage. Dock owners and stevedoring concerns able to serve more ships.

Write for new Clark "TwinVeyor" Bulletin and actual cost figures on cargo-handling performance on Great Lakes and the seaboard.

The Clark Tructractor Co.

Battle Creek, Mich.

Attach this ADVERTISEMENT to your inquiry

Unusual STRENGTH is built into the ELWELL-PARKER

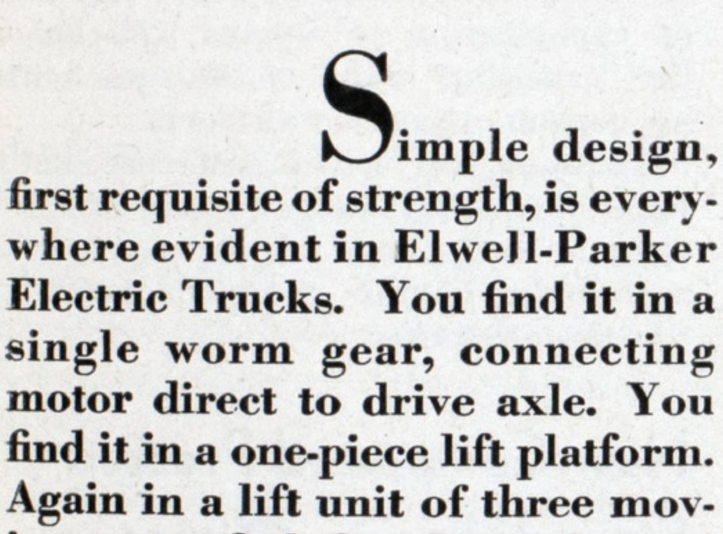
Simple design, first requisite of strength, is everywhere evident in Elwell-Parker Electric Trucks. You find it in a single worm gear, connecting motor direct to drive axle. You find it in a one-piece lift platform. Again in a lift unit of three moving parts. Only four heavy formed plates make up the basic frame construction.

Specific steels to suit the needs of specific parts give added strength. Molybdenum, for example, is employed for drive shafts. Chrome vanadium for universal joints. Phosphor bronze for worm wheels. Always, the best for each part.

Important as quality of steels are Elwell-Parker's methods of heat treating. Some parts are *double* heat treated. Others go through the fire *three* times. These methods, worked out through twenty-five year's experience provide extra strength where it is most needed. And without surplus weight to sap the source of power. Twenty-nine parts in the Elwell-Parker drive axle are drop forged.

The unusual strength produced by such engineering is important for you to consider. It means lower operating cost, lower maintenance, a bigger annual saving, longer period of service and therefore a bigger return on an electric truck investment.

Elwell-Parkers are made in 39 standard sizes and types to fit the particular requirements of your terminal. Write The Elwell-Parker Electric Company, 4200 St. Clair Avenue, Cleveland, Ohio.



Where the bulk of the load is carried. The Elwell-Parker trail axle is a masterpiece of refined design and rugged strength, operating freely in a restricted space.

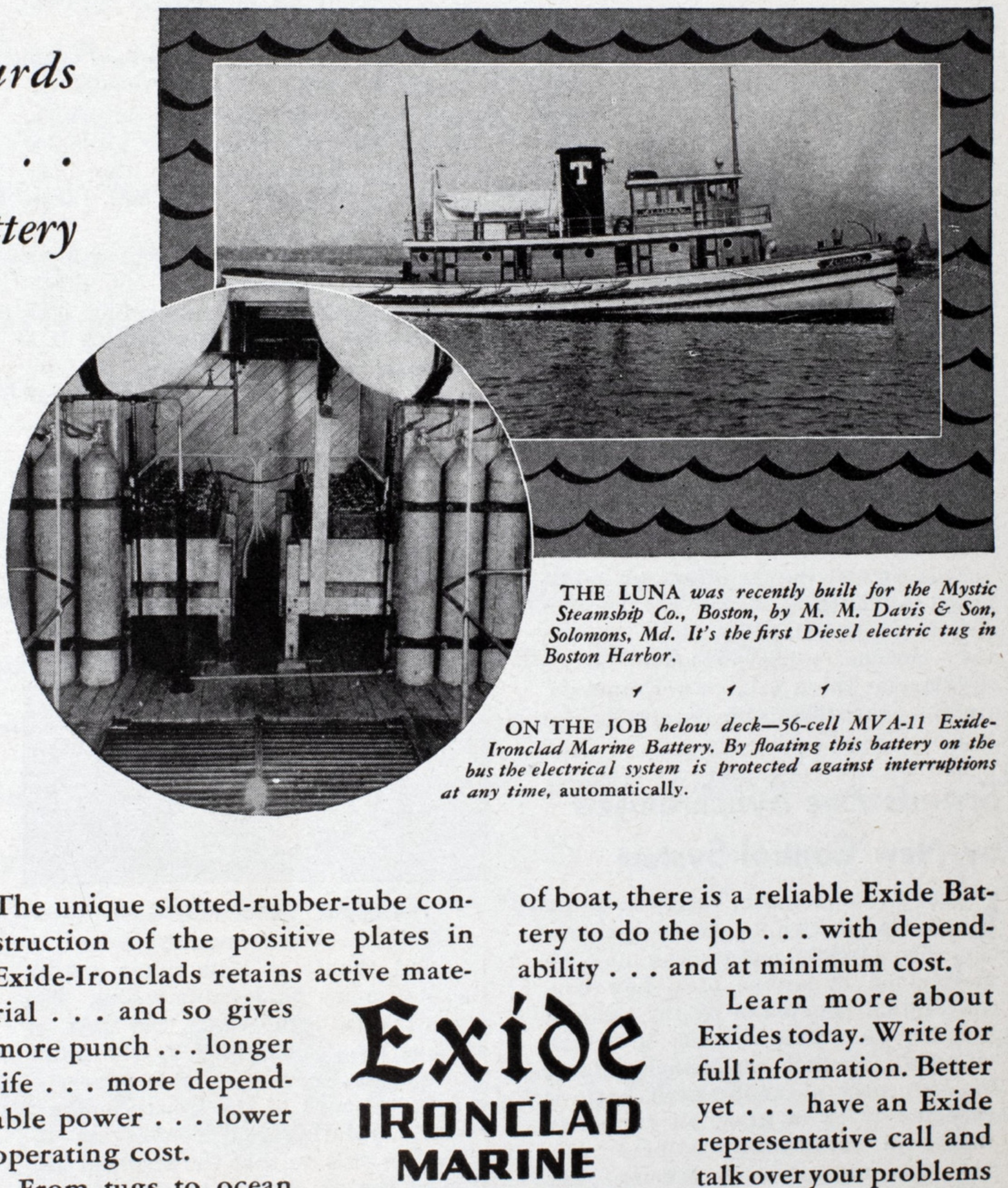
"Handling and Shipping On Skids" is a new booklet we will be glad to send interested executives. 16 pages. 75 photographs. A complete pictorial review of skid handling operations. Brimming with ideas. Send for it. No obligation.

ELWELL-PARKER

Designers and Builders of Electric Industrial Trucks, Tractors and Cranes for a Quarter Century.

FIRST *Diesel Electric Tug in Boston Harbor* USES EXIDES

New tug "Luna" guards against power failure . . . with Exide-Ironclad Battery



THE LUNA *was recently built for the Mystic Steamship Co., Boston, by M. M. Davis & Son, Solomons, Md. It's the first Diesel electric tug in Boston Harbor.*

ON THE JOB *below deck—56-cell MVA-11 Exide-Ironclad Marine Battery. By floating this battery on the bus the electrical system is protected against interruptions at any time,* automatically.

SHOULD *Luna's* normal source of power be interrupted, an Exide-Ironclad is on the job to take over the entire auxiliary load automatically . . . and what a load it is.

The Exide Marine Floating Battery System on this outstanding new tug includes 56 cells of MVA-11 Exide-Ironclad. At all times this powerful battery is connected to the electrical system, ready to supply current instantly and automatically, for these many important jobs:

Steering gear, circulating water pumps, lubricating oil pumps, engine telegraph, lights and field excitation for main electrical machinery, two motor-driven air compressors, fire and bilge pumps, fuel transfer pump, sanitary pumps, electric refrigerator, and searchlights.

The unique slotted-rubber-tube construction of the positive plates in Exide-Ironclads retains active material . . . and so gives more punch . . . longer life . . . more dependable power . . . lower operating cost.

From tugs to ocean liners, for every type of boat, there is a reliable Exide Battery to do the job . . . with dependability . . . and at minimum cost.

Exide
IRONCLAD MARINE BATTERIES

Learn more about Exides today. Write for full information. Better yet . . . have an Exide representative call and talk over your problems with you. No obligation.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
THE WORLD'S LARGEST MANUFACTURERS OF STORAGE BATTERIES FOR EVERY PURPOSE
Exide Batteries of Canada, Limited, Toronto

The Full Measure of Power!

IT IS power on the towline that counts with a tug. When accelerating a tow, retarding a tow, or when warping a ship into dock at standstill speeds, Diesel-electric drive gives its full measure of power. It asks no compromise.

The Erie Railroad's choice of G-E Diesel-electric drive for four new tugboats is only another example of the decided preference for its use on tugs, ferries, tankers, and boats of special type. Its easy adaptation to different types of vessels is bringing wide acceptance for this dependable form of drive.

«◆» «◆» «◆»

General Electric manufactures complete turbine propulsion machinery, electric equipment for ships' auxiliaries, searchlights, and marine accessories of many kinds. Its exceptional facilities are always at the disposal of modern ship operators. For complete information, write to the General Electric Company, Schenectady, N. Y.

Join us in the General Electric program, broadcast every Saturday evening on a nation-wide N.B.C. network

GENERAL ELECTRIC

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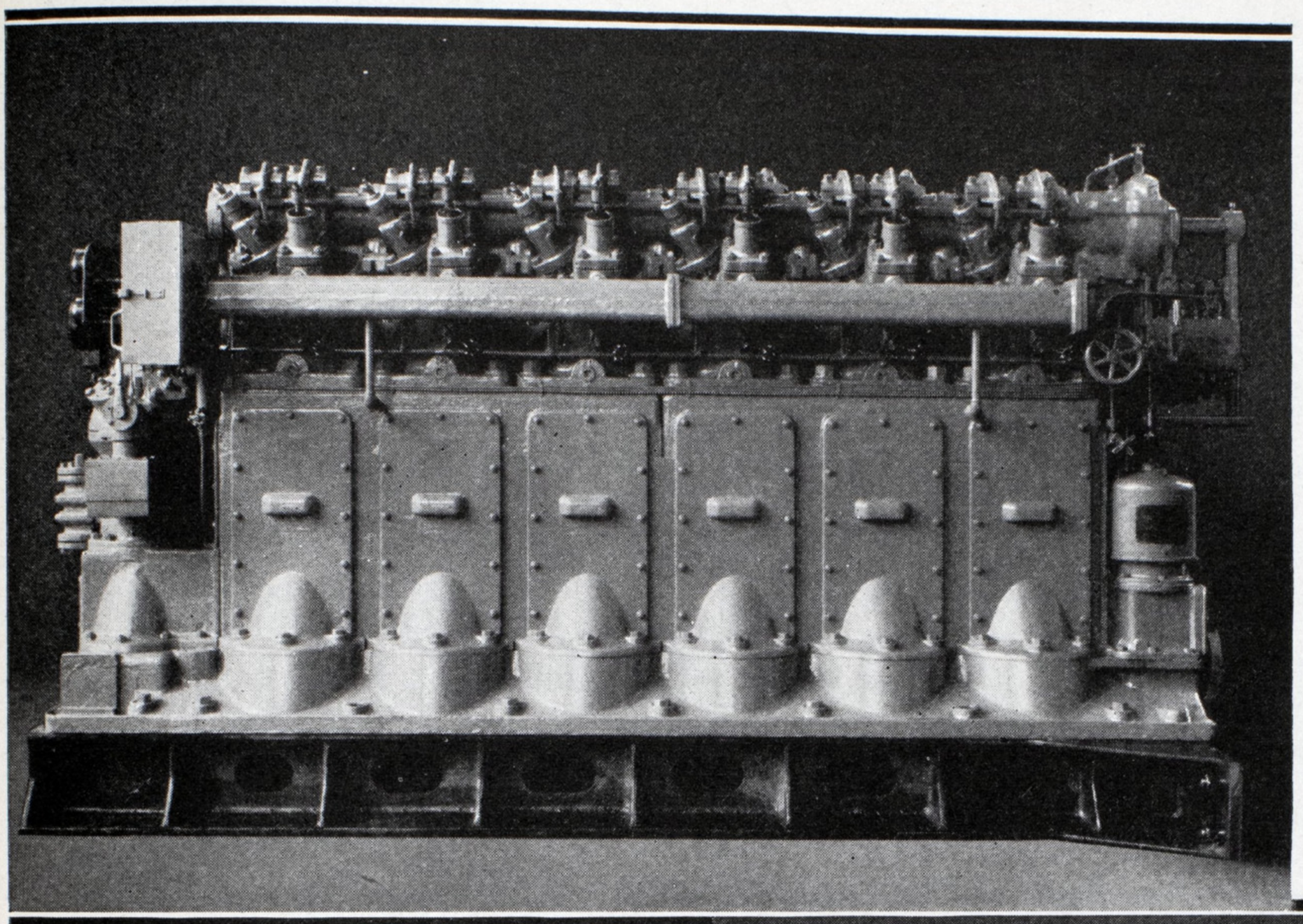
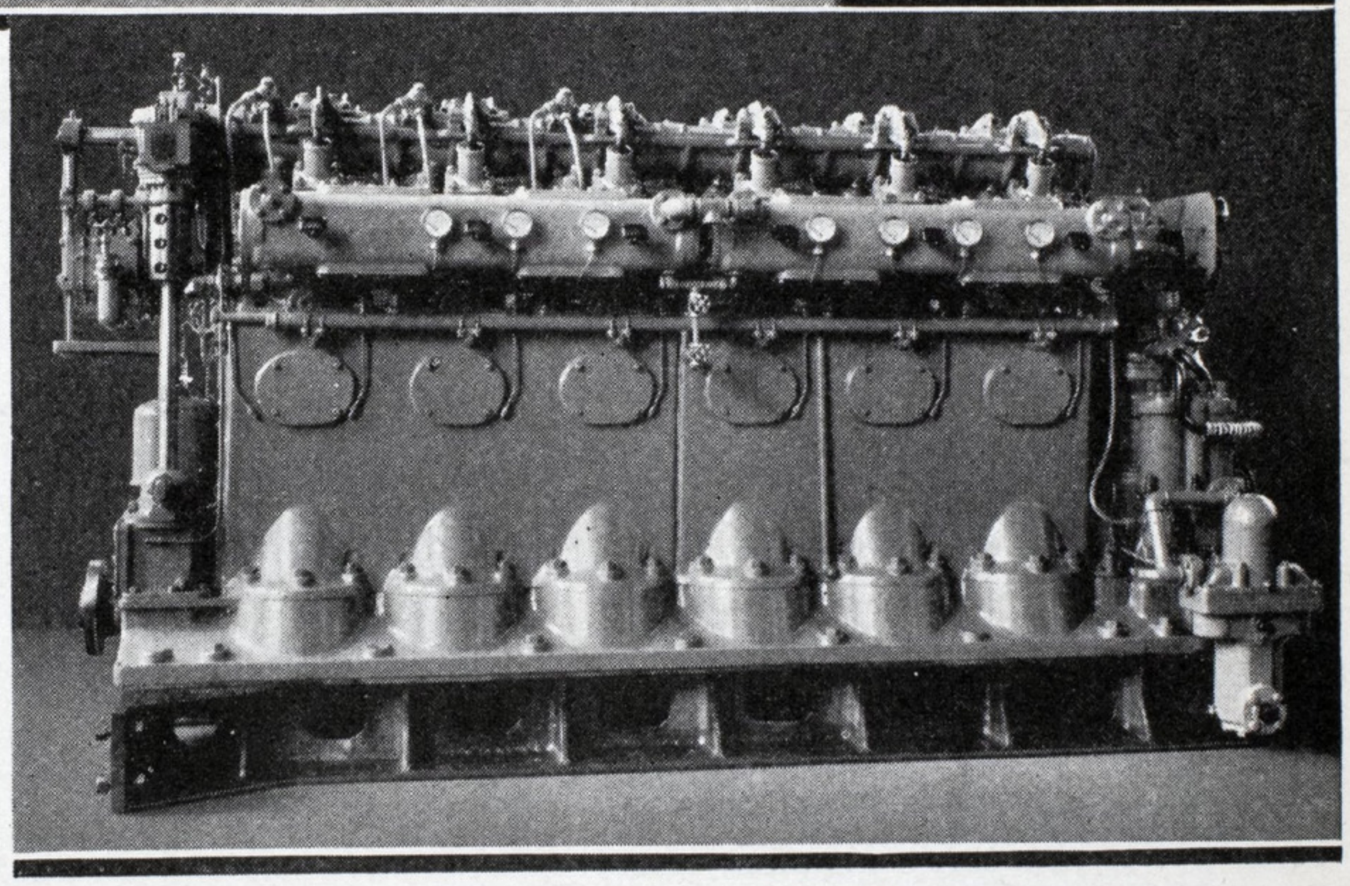
Quality for PERFORMANCE



LONG LIFE and EASY UPKEEP

QUALITY in LOMBARD-Diesels goes further than care in selection of materials and precision in manufacture. It begins with a fuel combustion system which is unequalled for efficiency, ease of handling, and beneficial effect on engine life. It includes a number of improvements in design for better and more lasting service, and the rare quality of LOMBARD accessibility makes future maintenance simple and easy.

No chain is stronger than its weakest link. In LOMBARD-Diesels, such quality thruout assures exceptional performance thruout the long life it is reasonable to expect of air-injection four-cycle engines.

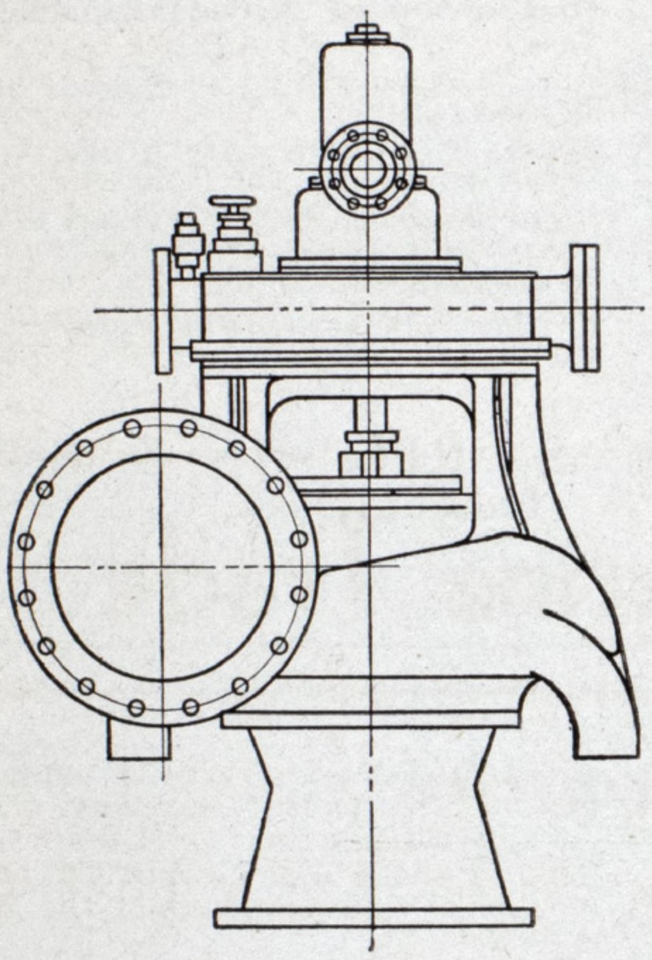


LOMBARD-Diesels are really accessible. Outstanding features are conveniently removable caged valves; simple lever valve drive; easy access to pistons thru large front doors; greatly simplified compressor, fuel pump and governor details. Involved mechanisms and intricate adjustments are avoided; instead, there is every incentive to do any necessary maintenance work when "a stitch in time saves nine."

THE LOMBARD GOVERNOR CO.
ASHLAND, MASS.

LOMBARD-DIESEL
AIR-INJECTION FOUR-CYCLE

A *new* condenser circulating pump



Six 20″ Warren-Moody pumps for condenser circulating service will be installed aboard the new Matson Liners.

New in principle and design, the Warren-Moody spiral pump for handling large volumes at low heads has three outstanding advantages which make it particularly suitable for condenser circulating service.

1. It is compact and occupies less space than other pumps used for the same purpose. All parts are easily accessible.

2. Its initial cost is less than that of other pumps used for this service.

3. It can be operated at higher speeds than those customarily used, permitting the use of a turbine drive with its higher turbine economy.

Built by Warren, under the patents of Lewis F. Moody, this new pump, because of its efficiency and economy, will replace many other types of pumps now used for condenser circulating service.

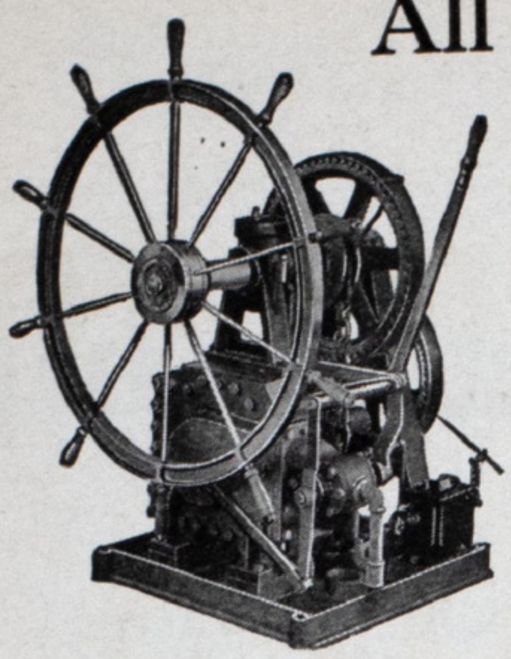
WARREN STEAM PUMP COMPANY, Inc.
WARREN . . . . . MASSACHUSETTS

Warren Engineering Corp., 117 Liberty Street, New York City
M. L. Katzenstein, President

Western Engineering Company, 58 Main Street
San Francisco, California

4698

All Over the Lakes They're Using Dake's

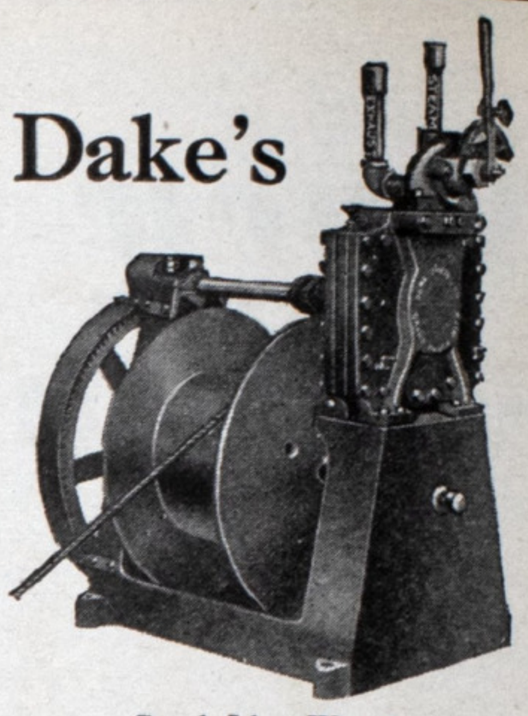


"CS" Steering Gear

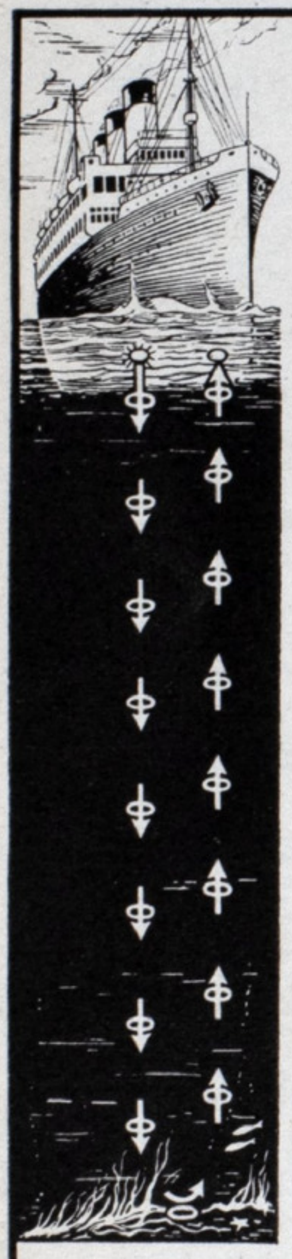
Go into any port of consequence on the Great Lakes and you will find vessels using DAKE Steering Gears, Capstans, Windlasses or other auxiliaries. Ask the owners and you will find they give efficient dependable service, with the least expense for upkeep. DAKE Auxiliaries are all simple of construction and very compact. They require less space and very little attention. Write for information on any auxiliaries you are interested in.

Steering Gears, Capstans (hand and steam) Anchor Windlasses, Stage Hoists, Snub Line Winches, Spud Lifters, Net Lifters and Marine Castings.

Dake Engine Co., GRAND HAVEN, MICHIGAN



Snub Line Winch



Fathometer
VISUAL ECHO SOUNDINGS

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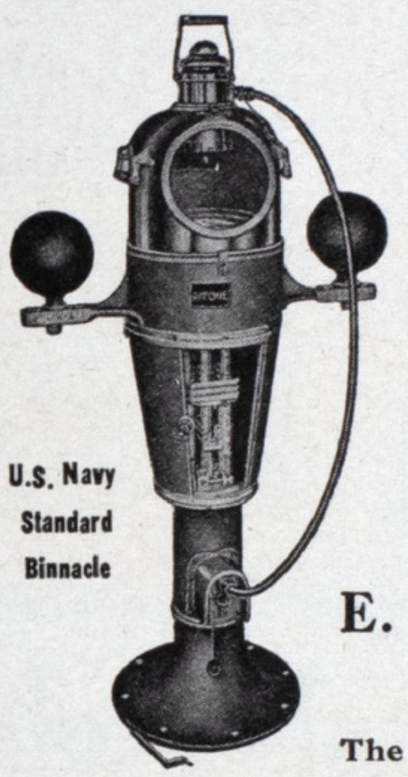

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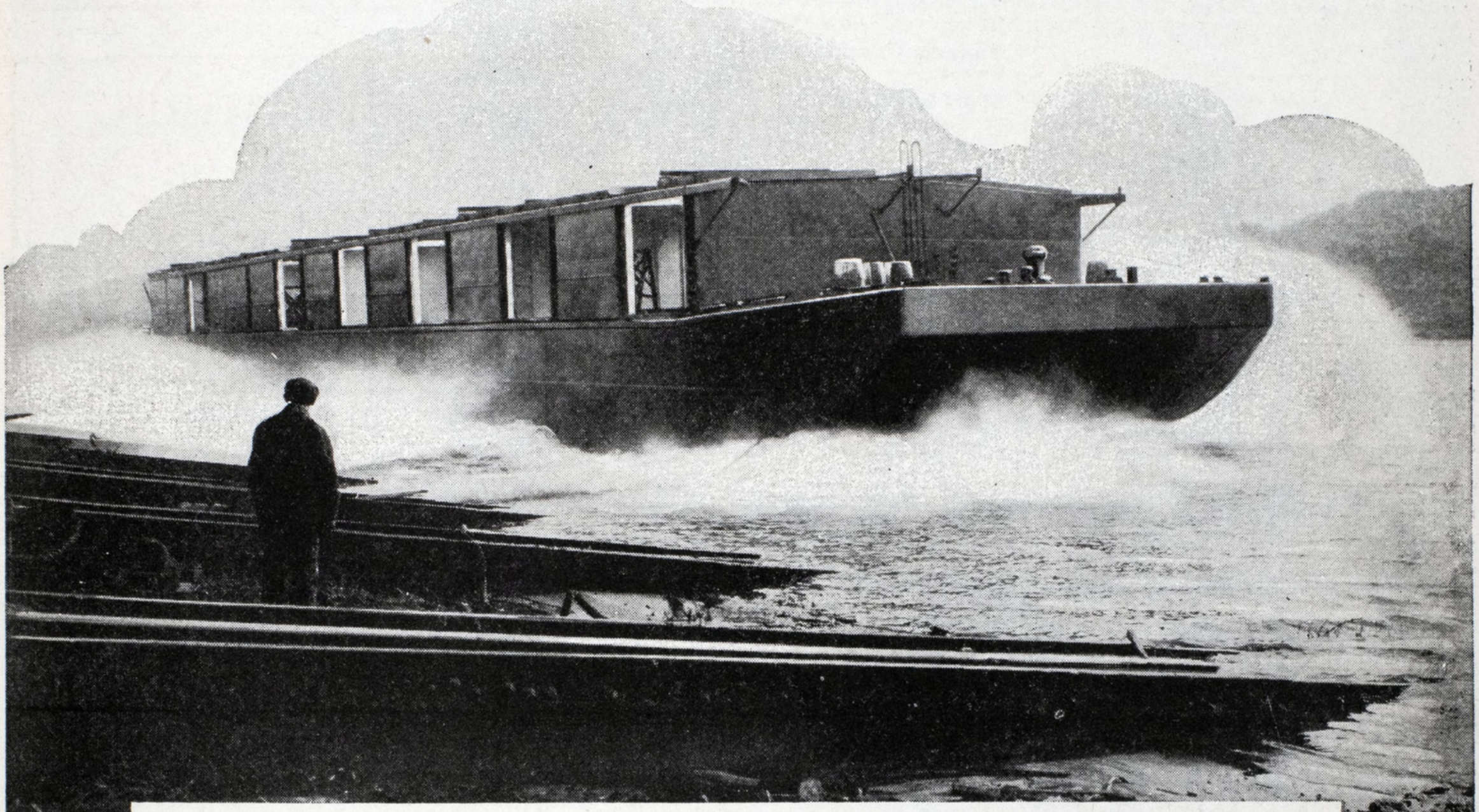

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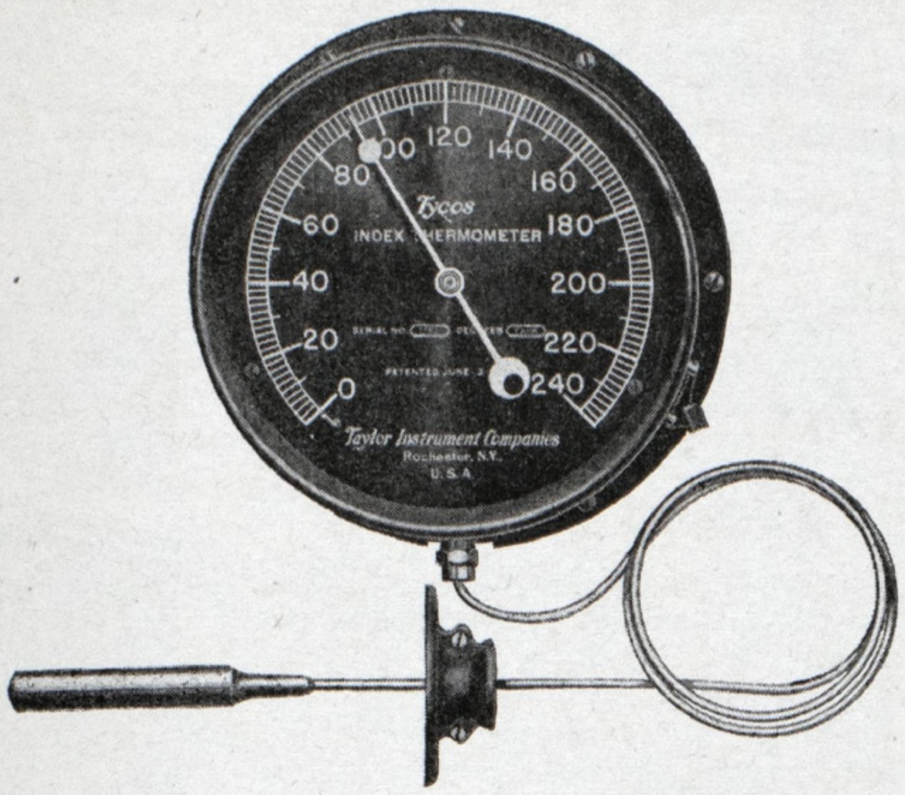

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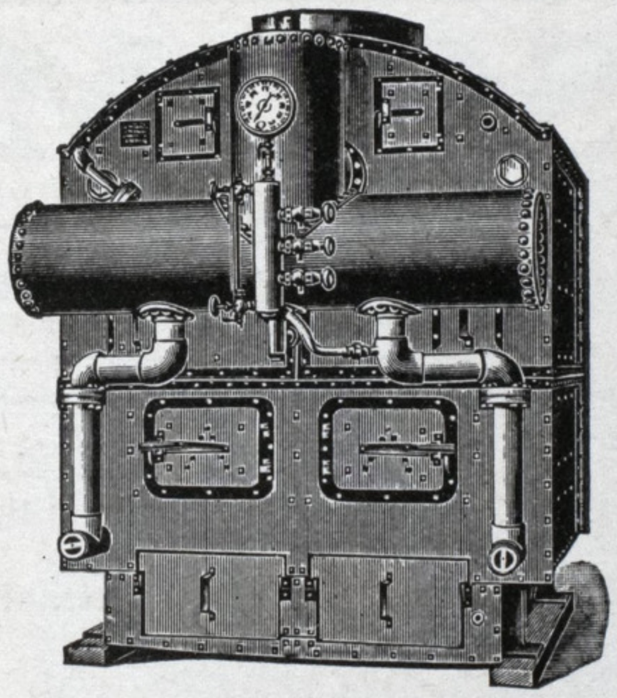

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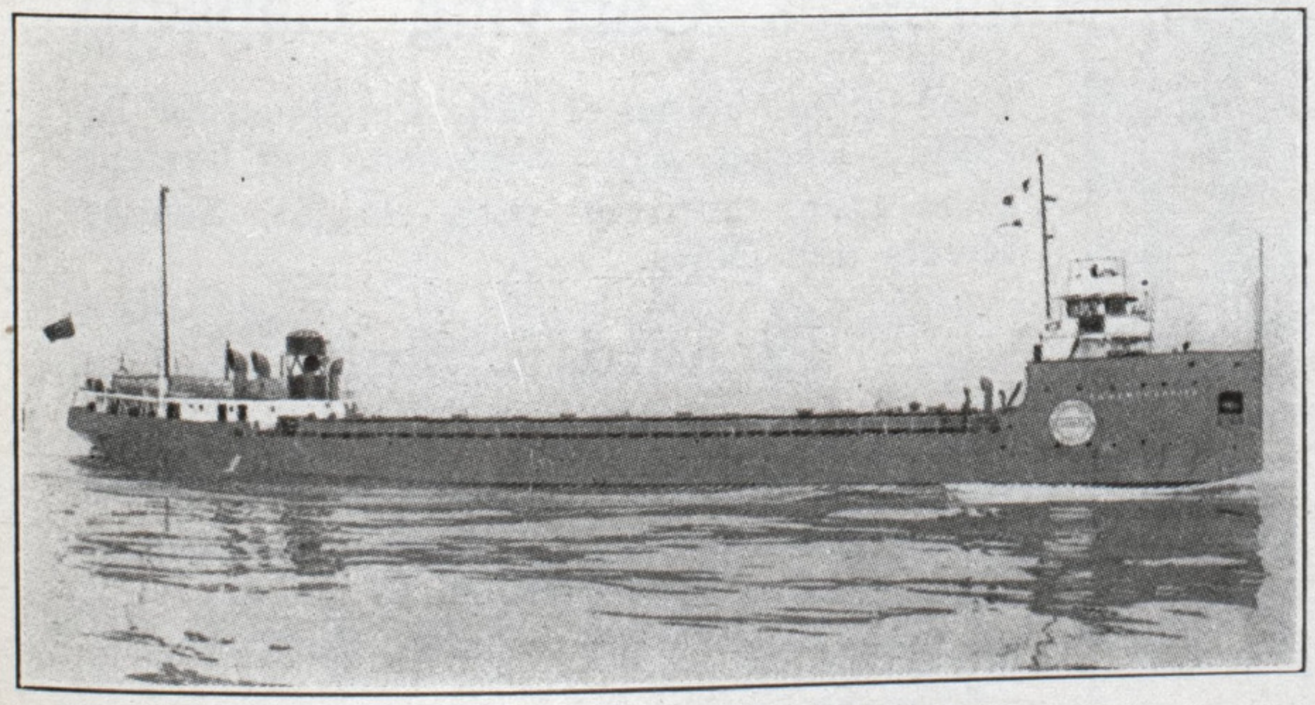

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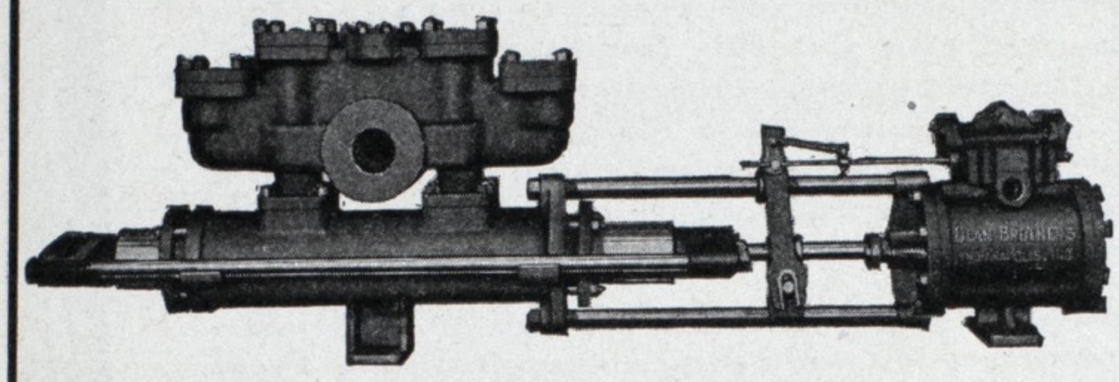

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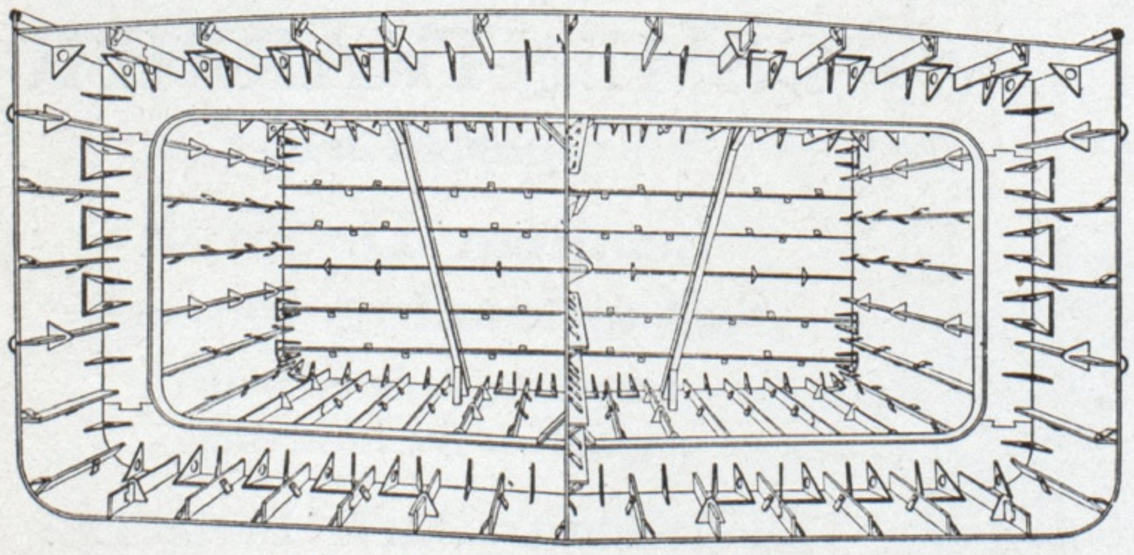

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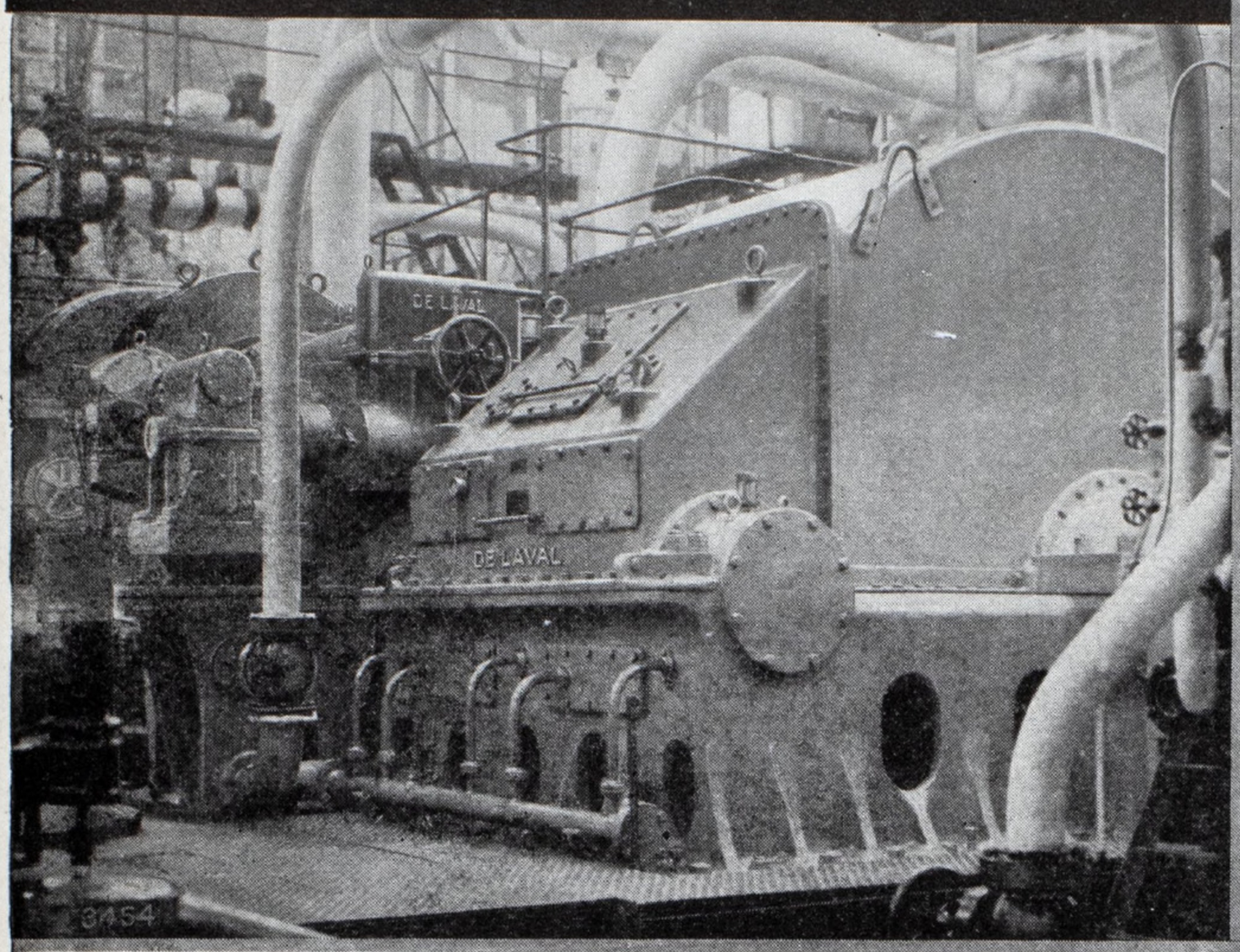

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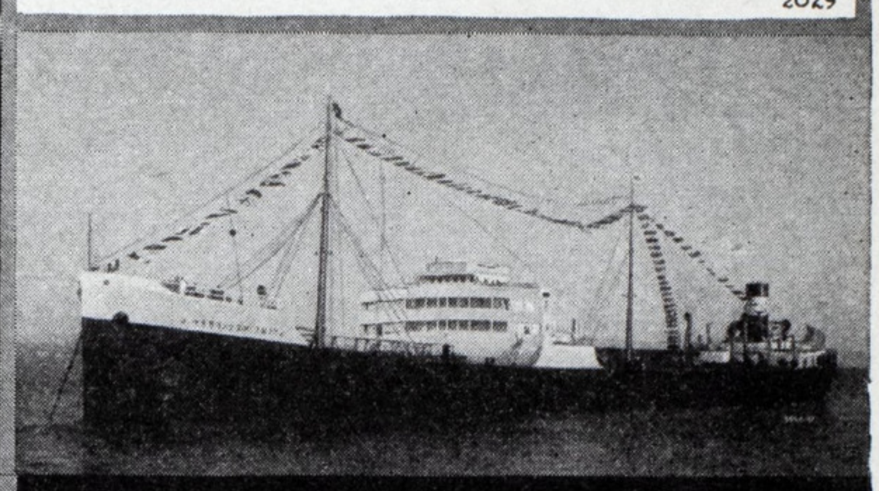

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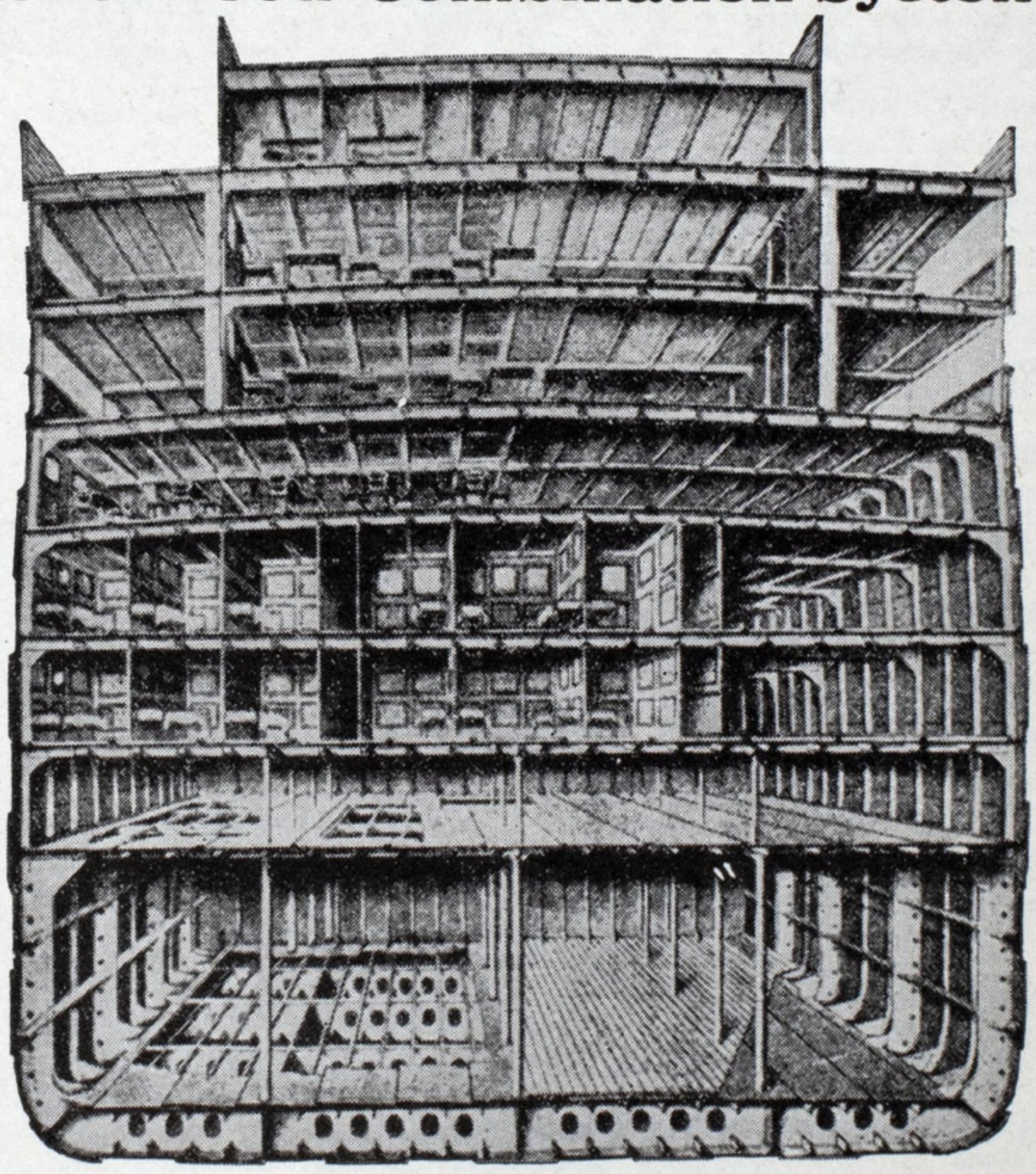

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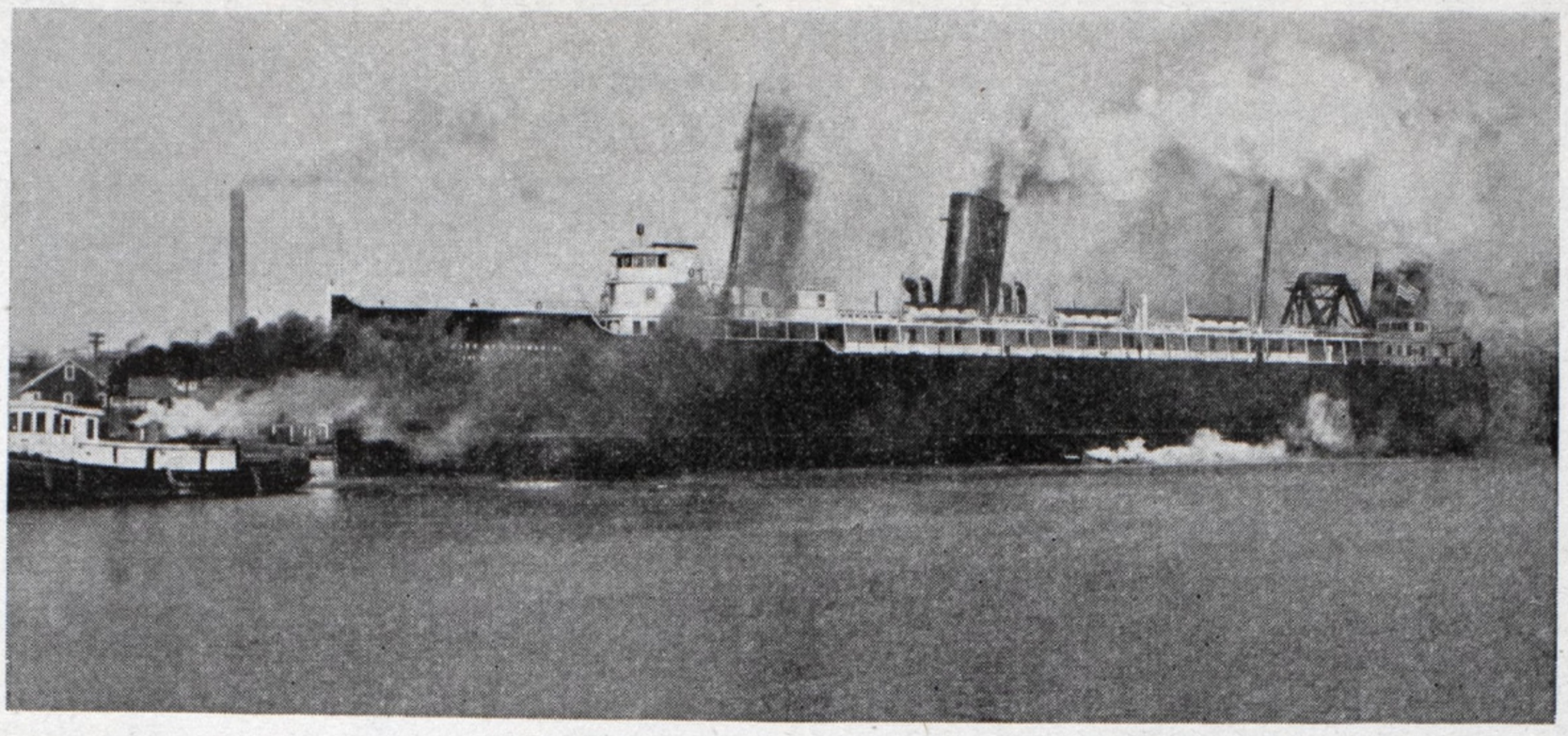

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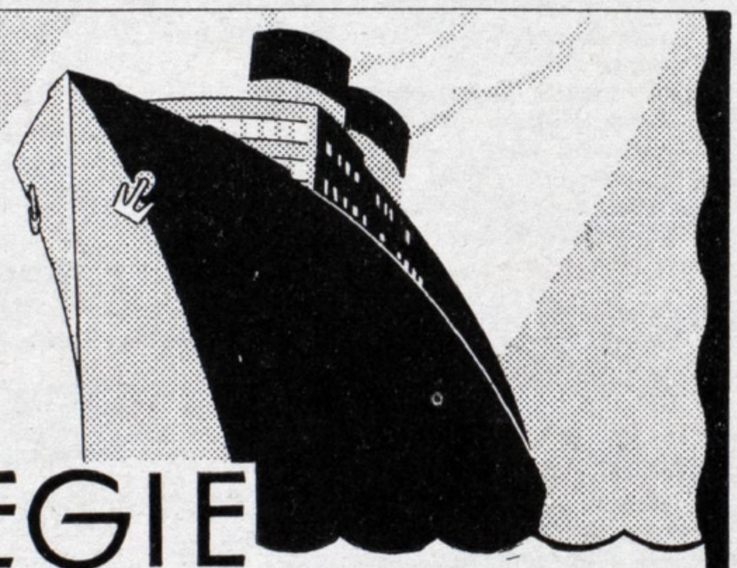

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A complete line of structural steel sections for shipbuilding purposes, including Carnegie Beams with their wide, parallel flanges, shipbuilding channels and bulb angles, Carnegie Floor Plate in a raised pattern insuring long wear and easy cleaning, and rolled steel plates of every description.

The name "Carnegie" has been identified with steel manufacture for nearly three-quarters of a century—a good name to look for on Steel.

CARNEGIE STEEL COMPANY

Subsidiary of United States Steel Corporation

PITTSBURGH, PA.

62

Ship and Yacht Yards

realize that the basis of their success rests on economical and efficient drydocking equipment.

Progressive yards are coming more and more to be CRANDALL equipped for they know that

Crandall Railway and Floating Dry Docks

mean economy and efficiency, and that the designs are backed by more than 75 years of successful dry dock experience.

Let us send you further information

The Crandall Engineering Co.

134 Main Street **Cambridge, Mass.**

ENGINES (Marine)
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Ingersoll-Rand Co.,
11 Broadway, New York City.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
New York Shipbuilding Co.,
Camden, N. J.
Sturtevant, B. F., Co., Inc.,
Hyde Park, Boston, Mass.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.
Todd Shipyards Corp.,
25 Broadway, New York City
United Dry Docks, Inc.,
11 Broadway, New York City.

ENGINES (Oil)
Cooper-Bessemer Corp., The,
Grove City, Pa.
Ingersoll-Rand Co.,
11 Broadway, New York City.
Lombard Governor Co., The,
Ashland, Mass.
Standard Motor Construction Co.,
184 Whiton St.,
Jersey City, N. J.
Sun Shipbuilding & Dry Dock Co.,
Chester, Pa.

ENGINES (Steam, Steering)
Dake Engine Co.,
Grand Haven, Mich.

ENGINES (Vertical, Enclosed, Self Oiling)
Troy Engine & Machine Co.,
Troy, Pa.

EUROPEAN STEAMSHIP LINES (Passenger and Freight)
Hamburg-American Line
39 Broadway, New York City.

EVAPORATORS
Griscom-Russell Co.,
285 Madison Ave., New York City.

FANS (Electric)
General Electric Co.,
Schenectady, N. Y.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

FAUCETS
Haydenville Co., The,
Haydenville, Mass.

FEED WATER HEATERS—See HEATERS AND PURIFIERS (Feed Water)

FEED WATER REGULATORS
Babcock & Wilcox Co.,
85 Liberty St., New York City.

FIRE BRICK
Babcock & Wilcox Co., The,
85 Liberty St., New York City.

FLOODLIGHTS (Acetylene)
Oxweld Acetylene Co., The,
30 E. 42nd St., New York City.

FLOORING
Selby, Battersby & Co.,
33rd & Arch Sts., Philadelphia.

FLOOR PLATES
Carnegie Steel Co.,
Carnegie Bldg., Pittsburgh, Pa.

FOUNDERS
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
New York Shipbuilding Co.,
Camden, N. J.

FREIGHT SERVICE
Hamburg-American Line,
39 Broadway, New York City.

FUEL OIL
Standard Oil Co. of New Jersey,
26 Broadway, New York City.
Vacuum Oil Co.,
61 Broadway, New York City.

FURNITURE (Metal)
Simmons Co., The, 666 Lake Shore Drive, Chicago, Ill.

GAGES (Water)
Jerguson Gage & Valve Co.,
Somerville, Mass.

GALLEY RANGES
Stamford Foundry Co.,
Stamford, Conn.

GAUGES (Pressure, Vacuum)
Taylor Instrument Co's.,
90 Ames St., Rochester, N. Y.

GEARS (Marine Equipment)
General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

GENERATING SETS
Troy Engine & Machine Co.,
Troy, Pa.

GENERATING SETS (Direct Connected)
General Electric Co.,
Schenectady, N. Y.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Troy Engine & Machine Co.,
Troy, Pa.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

GENERATORS
Troy Engine & Machine Co.,
Troy, Pa.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

GREASE
Vacuum Oil Co.,
61 Broadway, New York City.

GREASE (Launching)
Vacuum Oil Co.,
61 Broadway, New York City

GYRO-PILOT (Automatic Steering)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

HAWSERS (Manila)
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston.
Whitlock Cordage Co.,
46 South St., New York City.

HEATERS AND PURIFIERS (Feed Water)
Davis Engineering Co.,
90 West St., New York City.
Griscom-Russell Co.,
285 Madison Ave., New York City.
Westinghouse Electric & Mfg. Co.,
So. Philadelphia, Pa.

HEATING EQUIPMENT
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

HEATING STOVES
Stamford Foundry Co.,
Stamford, Conn.

HOISTING ENGINES
Hyde Windlass Co., Bath, Me.

HOISTS (Air)
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland.
Ingersoll-Rand Co.,
11 Broadway, New York City

INDICATORS (Direction & Revolution)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

INDICATORS (Helm Angle)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

INDICATORS (Speed)
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

ICE MACHINES—See REFRIGERATING MACHINERY

INSURANCE (Marine)
Boland & Cornelius,
Marine Trust Bldg., Buffalo, N. Y.

LAMPS (Mazda and Arc)
General Electric Co.,
Schenectady, N. Y.

LIFEBOATS
Lane, C. M., Lifeboat Co., Inc.,
856 Humboldt St., Brooklyn, N. Y.
Welin Davit & Boat Corp.,
3-5 Vernon Ave.,
Long Island City, N. Y.

LIFESAVING EQUIPMENT
Lane, C. M., Lifeboat Co., Inc.,
856 Humboldt St., Brooklyn, N. Y.

LIGHTING EQUIPMENT
Westinghouse Electric & Mfg. Co.
S. Philadelphia, Pa.

LUBRICATING OIL
Standard Oil Co., of New Jersey,
26 Broadway, New York City.
Vacuum Oil Co.,
61 Broadway, New York City.

MACHINERY (Marine)
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
Cooper-Bessemer Corp., The,
Grove City, Pa.
Great Lakes Engineering Works.
River Rouge, Mich.
Manitowoc Ship Building Corp.,
Manitowoc, Wis.
Maryland Dry Dock Co.,
Baltimore Md.

MACHINES (Sounding)
Submarine Signal Co.,
160 State St., Boston, Mass.

MACHINISTS
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
New York Shipbuilding Co.,
Camden, N. J.

MAGNETS (Lifting)
Cutler-Hammer, Inc.,
1265 St. Paul Avenue,
Milwaukee, Wis.

MANILA OAKUM—See OAKUM (Marine, Rope, Packings, Plumbers)

MARINE RAILWAY BUILDERS
Crandall Engineering Co., The,
134 Main St., Cambridge, Mass.

MATERIAL HANDLING EQUIPMENT
Smith, Leathem D., Dock Co.,
Sturgeon Bay, Wis.

MATTRESSES
Simmons Co., The, 666 Lake Shore Drive, Chicago, Ill.

METERS (Gas & Air)
Cutler-Hammer, Inc.,
1265 St. Paul Avenue,
Milwaukee, Wis.

MOTOR GENERATOR SETS
General Electric Co.,
Schenectady, N. Y.
Troy Engine & Machine Co.,
Troy, Pa.
Westinghouse Electric & Mfg. Co.,
S. Philadelphia, Pa.

MOTORS (Electric)
General Electric Co.,
Schenectady, N. Y.
Troy Engine & Machine Co.,
Troy, Pa.
Westinghouse Electric & Mfg. Co.,
East Pittsburgh, Pa.

NAUTICAL INSTRUMENTS
Ritchie, E. S., & Sons,
Brookline, Mass.
Sperry Gyroscope Co., The,
Brooklyn, N. Y.

NAVIGATING INSTRUMENTS
White, Kelvin & Wilfrid O., Co.,
112 State St., Boston, Mass.

NEON
Linde Air Products Co., The,
30 E. 42nd St., New York City.

NITROGEN
Linde Air Products Co.,
30 East 42nd St., New York City

OIL BURNING EQUIPMENT
Babcock & Wilcox Co.,
85 Liberty St., New York City.
Coen Co., Inc., 610 S. Broadway,
Los Angeles, Cal.
Sturtevant, B. F., Co.,
Hyde Park, Boston, Mass.

OIL FOR ALL PURPOSES (Marine)
Vacuum Oil Co., 61 Broadway,
New York City.

OXY-ACETYLENE APPARATUS
Oxweld Acetylene Co., The,
30 E. 42nd St., New York City

OXYGEN
Linde Air Products Co.,
30 East 42nd St., New York City.

PASSENGER SERVICE
Hamburg-American Line,
39 Broadway, New York City.

POWDERED COAL BURNERS
Coen Co., Inc., 610 S. Broadway,
Los Angeles, Cal.

PROPELLER BLADES AND HUBS
Sheriffs Mfg. Co., Milwaukee, Wis.

PROPELLER WHEELS
American Shipbuilding Co.,
Foot of W. 54th St., Cleveland, O.
Great Lakes Engineering Works,
River Rouge, Mich.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.
Sheriffs Mfg. Co., Milwaukee, Wis.

PROPELLERS
Ferguson, F., & Son,
Hoboken, N. J.
Hyde Windlass Co., Bath, Me.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway,
New York City.

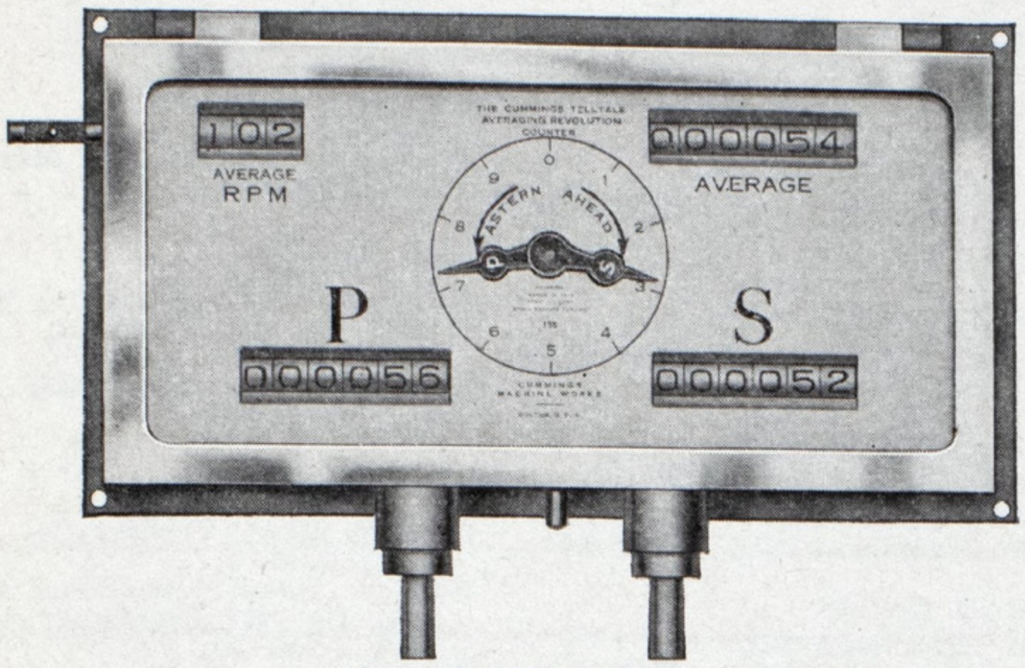
PULVERIZED COAL BURNERS
Fuller-Lehigh Co.,
Fullerton, Pa.
Todd Shipyards Corp.,
25 Broadway, New York City.

PULVERIZED COAL SYSTEMS
Fuller-Lehigh Co.,
Fullerton, Pa.
Todd Shipyards Corp.,
25 Broadway, New York City.

PUMPS
Dean Brothers Co.,
323 W. 10th St., Indianapolis, Ind.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

CUMMINGS NEW TWO SHAFT TELLTALE AVERAGING COUNTER



ALL IN ONE CASE

15 SECONDS TO GET AVERAGE R P M

Total Revolutions for the Port and Starboard Shafts. The Two Hand Telltale shows at a glance the actual Performance of Each Shaft ahead and back and the proportionate speed of each.

TORSION METERS

For Both Solid and Hollow Shaft

Full particulars upon application

Cummings Machine Works

255 Atlantic Ave., Boston, Mass.

SAMSON SPOT

Log Lines

Trade Mark Reg. U.S. Pat. Off.

Smooth, tough and durable; no adulterating material to stiffen it and decrease strength and durability. Solid braided of extra quality cotton yarn. Uniform in size and quality. Easily identified by the colored spots, our trade mark.

We also manufacture flag halyards, lead lines, tiller rope; solid braided cotton cord in all sizes for various marine uses. Ask for catalog and samples.

SAMSON CORDAGE WORKS

89 BROAD STREET BOSTON, MASS.

TRADE MARK

Oldman-Magee Boiler Works, Inc.

Boilers, Tanks, Stacks, Structural Work and Castings

Boiler Repairing Promptly Attended to Day or Night

MARINE WORK A SPECIALTY ELECTRIC WELDING

Works: 36-40 Illinois Street - BUFFALO, N. Y.

Kelvin & Wilfrid O. White Co.

112 State Street, Boston

Ship Compasses

Navigational Equipment

Contracts a Specialty

New York and Montreal

"This year, let's put in a SHIPMATE"

Each year at outfitting time the question of a new galley range confronts many yachtsmen and operators of commercial craft.

The way to settle this question is to install a SHIPMATE. Made to burn coal, wood, briquets, gas, kerosene, and fuel oil, there is a proper model for every size and type of boat.

STAMFORD FOUNDRY COMPANY

STAMFORD, CONN.

LANE LIFEBOATS

WERE SUPPLIED TO THE

BYRD ANTARCTIC EXPEDITION

C. M. Lane Lifeboat Co., Inc.

Brooklyn, N. Y.

PUMPS—Continued
Great Lakes Engineering Works, River Rouge, Mich.
Ingersoll-Rand Co., 11 Broadway, New York City.
Warren Steam Pump Co., Inc., Warren, Mass.

PUMPS (Ballast)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Warren Steam Pump Co., Inc., Warren, Mass.

PUMPS (Bilge)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Warren Steam Pump Co., Inc., Warren, Mass.

PUMPS (Boiler Feed)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Warren Steam Pump Co., Inc., Warren, Mass.

PUMPS (Direct Acting)
Dean Brothers Co.. 323 W. 10th St., Indianapolis, Ind.

PUMPS (Fuel Oil)
Coen Co., Inc., 610 S. Broadway, Los Angeles, Cal.

PUMPS (Power)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.

PUMPS (Steam)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.
Warren Steam Pump Co., Inc., Warren, Mass.

PUMPS (Vacuum)
Dean Brothers Co., 323 W. 10th St., Indianapolis, Ind.

PURIFICATION SYSTEMS—See WATER PURIFICATION SYSTEMS

PYROMETERS (Diesel Engine)
Taylor Instrument Co's., 90 Ames St., Rochester, N. Y.

RADIO COMPASS AND DIRECTION FINDER
Radiomarine Corp. of America, 66 Broad St., New York City.

RADIO EQUIPMENT
Radiomarine Corp. of America, 66 Broad St., New York City.

RAFTS
Lane, C. M., Lifeboat Co., Inc., 856 Humboldt St., Brooklyn, N. Y.

RAILWAY DRY DOCKS
Crandall Engineering Co., The, 134 Main St., Cambridge, Mass.

RANGES
Stamford Foundry Co., Stamford, Conn.

REFRIGERATING MACHINERY
Ingersoll-Rand Co., 11 Broadway, New York City

REPAIRS
Maryland Dry Dock Co., Baltimore, Md.

REPAIRS (Electric)
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

REPAIRS (Marine)
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Charleston Dry Dock & Machine Co., Charleston, S. C.
Chicago Shipbuilding Co., So. Chicago, Ill.
Great Lakes Engineering Works, River Rouge, Mich.
Manitowoc Ship Building Corp., Manitowoc, Wis.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
New York Shipbuilding Co., Camden, N. J.
Sun Shipbuilding & Dry Dock Co., Chester, Pa.
Todd Shipyards Corp., 25 Broadway, New York City.
United Dry Docks, Inc., 11 Broadway, New York City

REPAIRS (Turbine)
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

REVOLUTION COUNTERS
Cummings Machine Works, 255 Atlantic Ave., Boston, Mass.
Sperry Gyroscope Co., Manhattan Bridge Plaza, Brooklyn, N. Y.

ROPE (Manila, Net, Sisal, and Other Hard Fiber Cordage)
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston.
Whitlock Cordage Co., 46 South St., New York City.

ROPE (Transmission)
Columbian Rope Co., Auburn, N. Y.

RUBBER TILE
Selby, Battersby & Co., 33rd & Arch Sts., Philadelphia.

RUST PREVENTATIVE (Oil)
Vacuum Oil Co., 61 Broadway, New York City.

SAFETY VALVES (Marine)
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

SCHOONERS (Auxiliary)
American Shipbuilding Co., Foot of W. 54th St., Cleveland.

SEARCHLIGHTS (High Intensity)
Sperry Gyroscope Co., The, Brooklyn, N. Y.

SEARCHLIGHTS (Incandescent and Arc)
General Electric Co., Schenectady, N. Y.
Sperry Gyroscope Co., The, Brooklyn, N. Y.

SELF UNLOADING EQUIPMENT
Smith, Leathem D., Dock Co., Sturgeon Bay, Wis.

SEPARATORS (Oil)
Babcock & Wilcox Co., 85 Liberty St., New York City.

SHIPBUILDERS
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Charleston Dry Dock & Machine Co., Charleston, S. C.
Great Lakes Engineering Works, River Rouge, Mich.
Manitowoc Ship Building Corp., Manitowoc, Wis.
Maryland Dry Dock Co., Baltimore, Md.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
New York Shipbuilding Co., Camden, N. J.
Smith, Leathem D., Dock Co., Sturgeon Bay, Wis.
Sun Shipbuilding & Dry Dock Co., Chester, Pa.
Todd Shipyards Corp., 25 Broadway, New York City.
United Dry Docks, Inc., 11 Broadway, New York City.

SHIPBUILDING SYSTEMS
Isherwood, J. W., & Co., Ltd., 17 Battery Place, New York City.

SHIP STABILIZERS
Sperry Gyroscope Co., The, Brooklyn, N. Y.

SIGNALS (Submarine)
Submarine Signal Co., 160 State St., Boston, Mass.

SOUNDING MACHINES
Submarine Signal Co., 160 State St., Boston, Mass.

SPRINGS (Box, Bed)
Simmons Co., The, 666 Lake Shore Drive, Chicago, Ill.

STEAMSHIP LINES (Passenger and Freight)
Hamburg-American Lines, 39 Broadway, New York City.

STEAM GAGES
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

STEAM TRAPS
Davis Engineering Co., 90 West St., New York City.

STEEL BARGES—See BARGES (Steel)

STEERING ENGINES
Hyde Windlass Co., Bath, Me.

STEERING GEARS
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Hyde Windlass Co., Bath, Me.

STOKERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

STORAGE BATTERIES—See BATTERIES

STOVES
Stamford Foundry Co., Stamford, Conn.

STRAINERS (Oil)
Coen Co., Inc., 610 S. Broadway, Los Angeles, Cal.

SUPERHEATERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

SWITCHBOARDS
General Electric Co., Schenectady, N. Y.
Troy Engine & Machine Co., Troy, Pa.
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

TELEMOTORS
Hyde Windlass Co., Bath, Me.

THERMOMETERS (Temperature, Recording)
Taylor Instrument Co's., 90 Ames St., Rochester, N. Y.

TORSION METERS
Cummings Machine Works, 255 Atlantic Ave., Boston, Mass.

TOWING LINES
Columbian Rope Co., Auburn, N. Y.
Whitlock Cordage Co., 46 South St., New York City.

TRACTORS
Clark Tructractor Co., Battle Creek, Mich.
Elwell-Parker Electric Co., The, 4205 St. Clair Ave.. Cleveland, O.

TRANSMISSION (Rope)—See ROPE (Transmission)

TRUCKS
Clark Tructractor Co., Battle Creek, Mich.
Elwell-Parker Electric Co., The, 4205 St. Clair Ave., Cleveland, O.

TRUCKS (Dump)
Clark Tructractor Co., Battle Creek, Mich.

TURBINES (Electric)
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

TURBINES (Marine)
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

TURBINES (Steam)
DeLaval Steam Turbine Co., Trenton, N. J.
Newport News Shipbuilding & Dry Dock Co., 233 Broadway, New York City.
Sturtevant, B. F., Co., Hyde Park, Boston, Mass.
Westinghouse Electric & Mfg. Co., So. Philadelphia, Pa.

TWINE AND ROPE
Columbian Rope Co., Auburn, N. Y.
Samson Cordage Works, Boston.
Whitlock Cordage Co., 46 South St., New York City.

VENTILATING EQUIPMENT
Sturtevant, B. F., Co., Hyde Park, Boston, Mass.

VENTILATORS
Allen Corp., 1040 14th St., Detroit, Mich.

WATER PURIFICATION SYSTEMS
Griscom-Russell Co., 285 Madison Ave., New York City.

WELDERS (Electric Arc)
Westinghouse Electric & Mfg. Co., S. Philadelphia, Pa.

WELDING & CUTTING APPARATUS (Oxy, Acetylene, Oxy-Gas)
Oxweld Acetylene Co., The, 30 E. 42nd St., New York City

WELDING GAS
Prestolite Co., The, Inc., 30 E. 42nd St., New York City

WELDING SUPPLIES
Oxweld Acetylene Co., The, 30 E. 42nd St., New York City

WHISTLES
Star Brass Mfg. Co., 53 Oliver St., Boston, Mass.

WINCHES
Dake Engine Co., Grand Haven, Mich.
Hyde Windlass Co., Bath, Me.

WINDLASSES
American Shipbuilding Co., Foot of W. 54th St., Cleveland.
Dake Engine Co., Grand Haven, Mich.
Hyde Windlass Co., Bath, Me.

WIRELESS MESSAGE SERVICE
Radiomarine Corp. of America, 66 Broad St., New York City.

WIRELESS SETS AND APPARATUS
Radiomarine Corp. of America, 66 Broad St., New York City.

WORKBOATS
Lane, C. M., Lifeboat Co., Inc., 856 Humboldt St., Brooklyn.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

Baltimore City Office
310 E. Lombard St.
Plaza 1935

New York Office
No. 1 Broadway
Digby 2173

The Maryland Dry Dock Company

BALTIMORE, MD.

Drydocking, Shipbuilding and Ship Repairs of All Kinds

The Most Modern Shops in Baltimore — 2—9000 Ton Floating Drydocks

Floating Machine Shop

DAY and NIGHT SERVICE

Plant Phones: Curtis 0500 - 0501 - 0502 - 0503

Edward P. Farley & Co.

Incorporated

Steamship Owners, Agents and Brokers

11 Broadway—New York

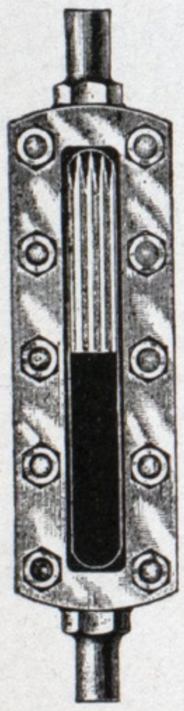
John J. Boland — Adam E. Cornelius

BOLAND & CORNELIUS

VESSEL OWNERS AND BROKERS

Marine Insurance Agents

Marine Trust Building BUFFALO, N. Y.



REFLEX WATER GAGES

Used on all types of boilers by all the Principal Navies of the world

"The Water Shows Black"

ADVANTAGES: Quick and reliable observation of the water level. Safe, sure and durable at high pressure. Not affected by cold air drafts. Most effective protection against injuries to boilers and workmen. Easily applied to all types of gage glass fittings.

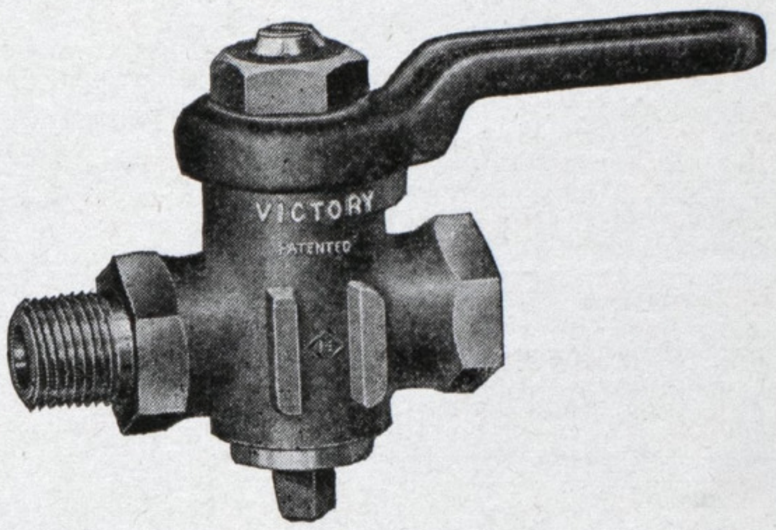
When filled with **WATER** the Reflex Gage always appears **BLACK**. When empty it instantly shows **WHITE**. No mistake possible. This feature alone is worth many times the cost of the Reflex.

Send for catalog of Water Gage Apparatus

MANUFACTURED BY THE

JERGUSON GAGE & VALVE CO.

WINTER HILL, SOMERVILLE, MASS.



VICTORY

LUBRICATED AIR COCKS

For Hard Service

in

Shipyards and Foundries

Write for particulars

THE HAYDENVILLE CO.

Haydenville, Mass.

For Ropeconomy Use

WATERFLEX WHITLOCK CORDAGE

The Utmost in Rope Value

Classified Advertisements

For Sale and Miscellaneous—Help and Positions Wanted

For Sale and Miscellaneous Advertisements
10c per word—minimum advertisement—$3.00

Six words must be added for box address.

To insure insertion, advertisements must reach us by the 10th of the month.

Help Wanted Advertisements
6c per word—minimum advertisement—$3.00

Position Wanted Advertisements
4c per word—minimum advertisement—$1.00

Please have remittance accompany order.

For Sale

FOR SALE
STEAM TUG "MONITOR"

70′ x 15′ x 9′ draft, 45-tons gross, oak hull rebuilt 1918, main engine two-cylinder, vertical non-condensing, size 16 x 18, equipped with Scotch Marine boiler, working pressure 150 lbs. Blake steering engine, pumps, complete equipment. Price $3000. Detailed specifications furnished on request. St. Lawrence River Power Company, Massena, New York.

FOR SALE—WOODEN STEAMER LANGELL BOYS, capacity 500,000 ft. lumber on 12′6 craft. In first class condition, now in winter quarters at Saginaw. Apply to Carrollton Steamship Company, Saginaw, Michigan.

Position Wanted

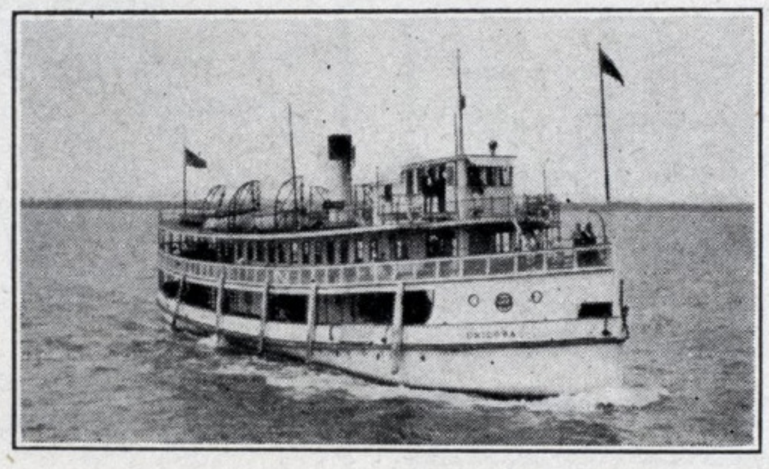
POSITION WANTED AS ENGINEER (DIESEL) ferry yacht or tug. Ten years experience. Will go anywhere. Best of references. Write or wire H. C. Stringer, Hathorn, Miss.

POSITION WANTED: AS ASSISTANT TO executive, junior executive, or representative of steamship company, vessel brokers, forwarding company, shipbuilding company, or manufacturer of marine equipment. Young man, single, thirty years old, graduate leading school of commerce, four years with Great Lakes passenger and package freight line, member family of steamship operators. Have traveled United States, Canada, European and Mediterranean countries and willing to go anywhere in those countries. Available immediately. Box 419, MARINE REVIEW, Cleveland, Ohio.

For Sale

LIGHTER
FOR SALE

One new steel combination oil and deck lighter—80 x 26 x 6 ft. Charleston Dry Dock & Machine Company, Charleston, S. C.



ON ACCOUNT OF DISCONTINUING AMUSEment Park for subdivision will sell two steel Passenger Steamers—S.S. Bedell, length 104 feet, breadth 28 feet, draft 8 feet, 700 passengers. S.S. Chicora, length 124 feet, breadth 33 feet, draft 8 feet, 1000 passengers. Both in first class condition. Details on application—Erie Beach Park, Ltd., 402 Walbridge Building, Buffalo, N. Y.

For Sale

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WANTED
SEVERAL DECK SCOWS

Large size, steel preferred, for hauling gravel—Give full description also age, price and picture if possible.

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33 North LaSalle St., Chicago

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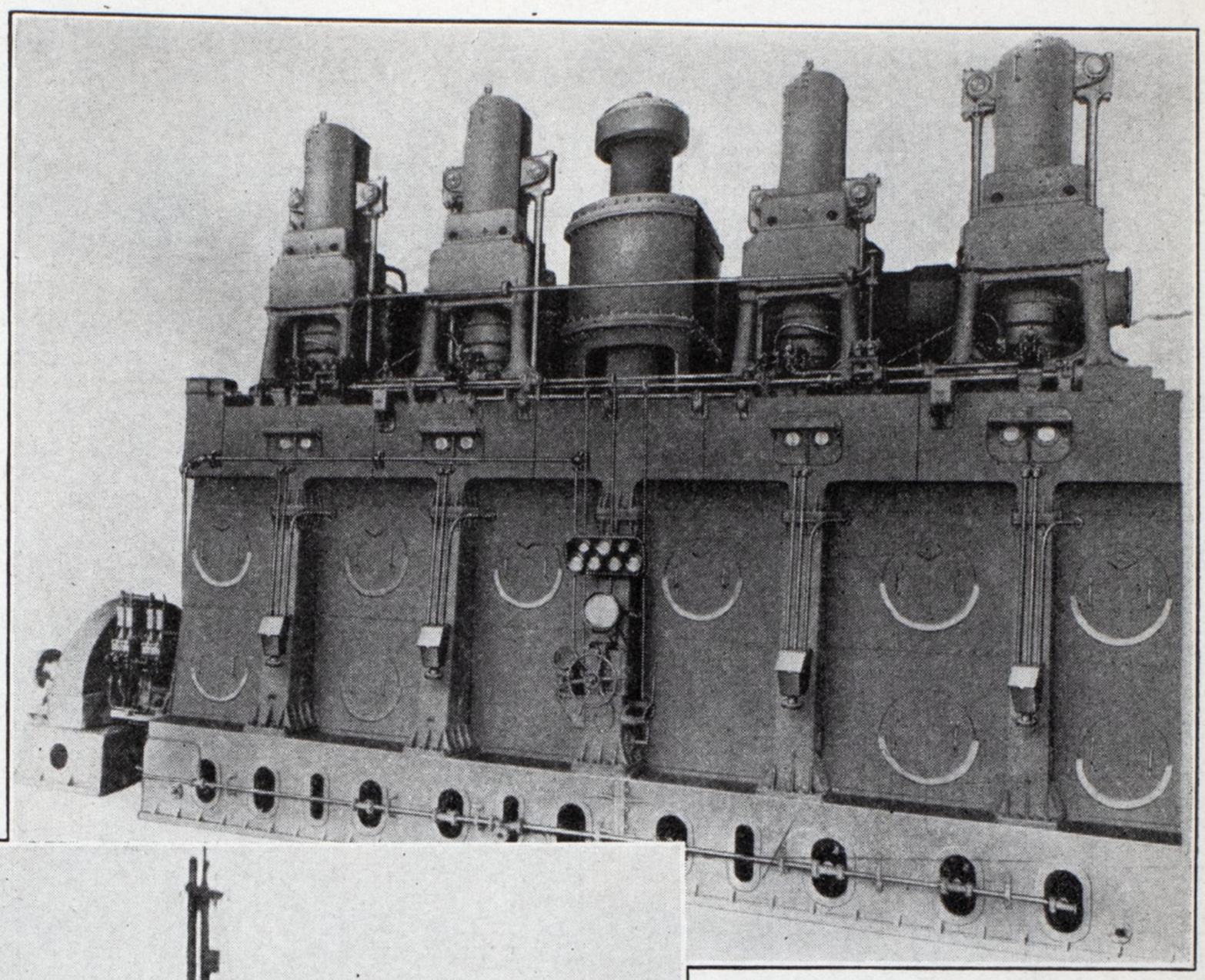

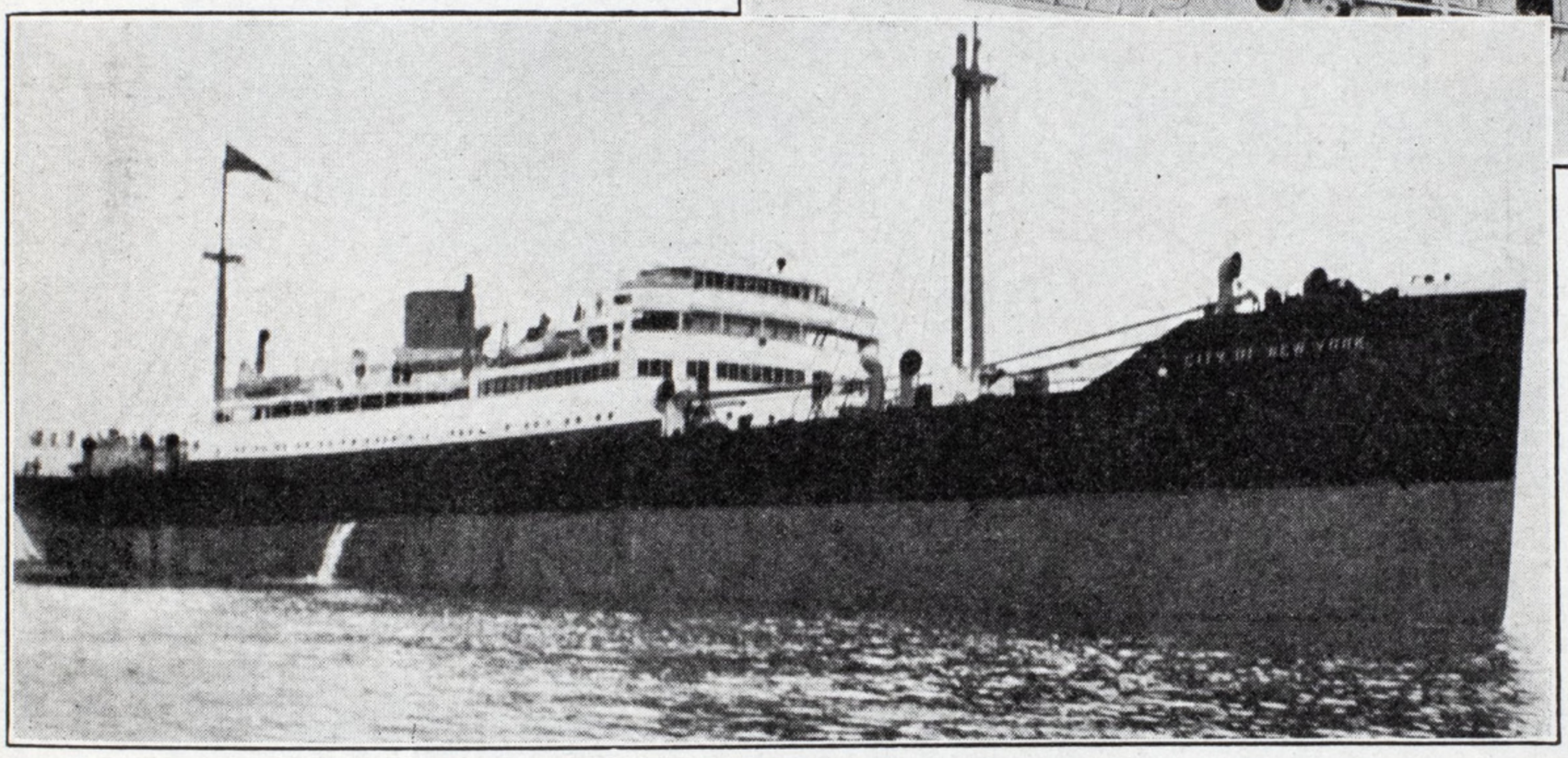

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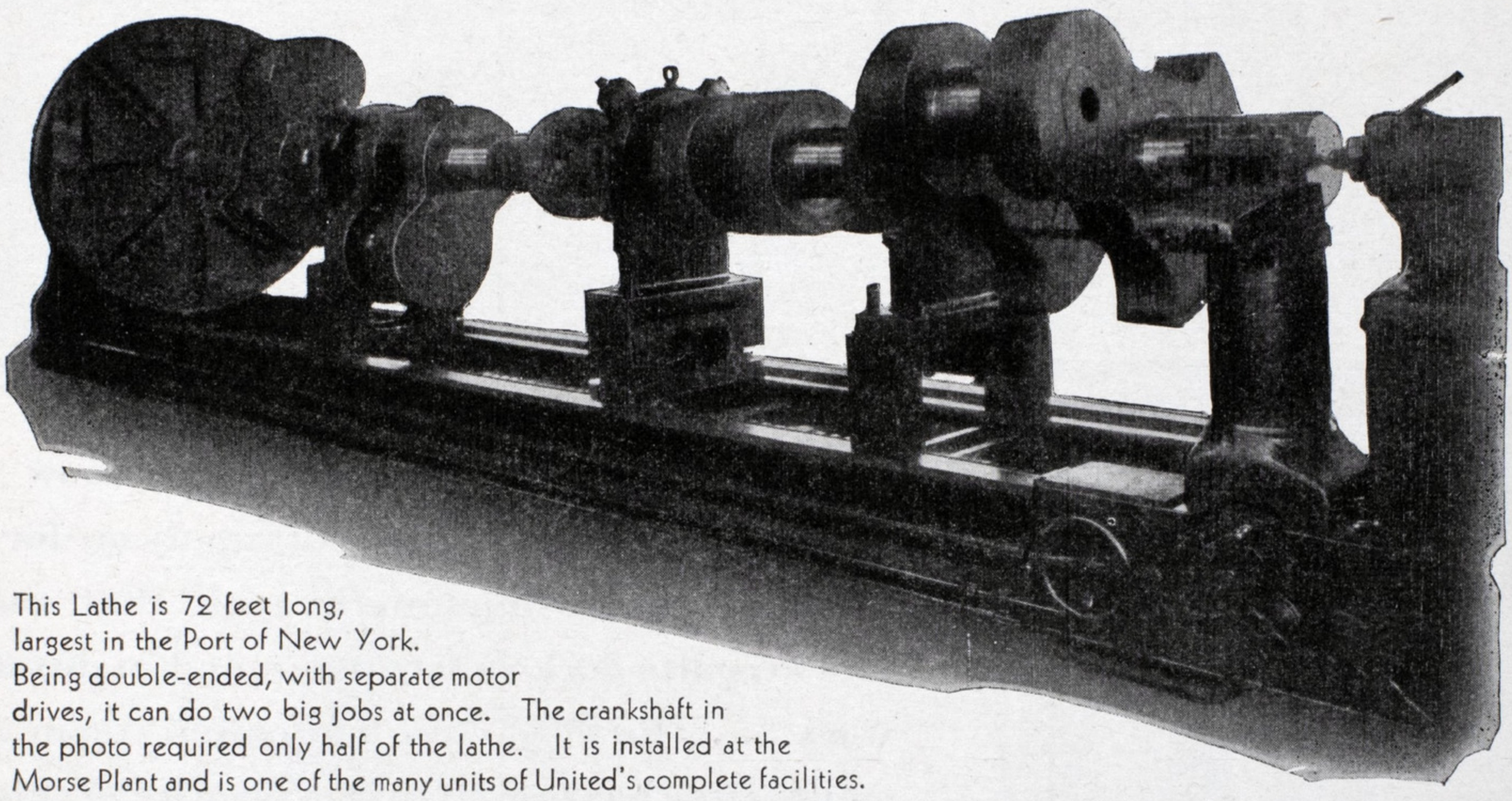

This Lathe is 72 feet long, largest in the Port of New York. Being double-ended, with separate motor drives, it can do two big jobs at once. The crankshaft in the photo required only half of the lathe. It is installed at the Morse Plant and is one of the many units of United's complete facilities.

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The four-throw crankshaft pictured here weighs 22 tons » » a large order for any machine shop » » but United is geared for big things. This giant shaft was lifted out of a ship at pier side by our 25-ton derrick, transported to the shops, picked up by the 25-ton crane that serves the lathe, and set up in jig time. No lost motion—or time—anywhere along the line; United is ready at all times to do a big or a little job and do it well.

Five complete plants—one superior service.

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INCORPORATED

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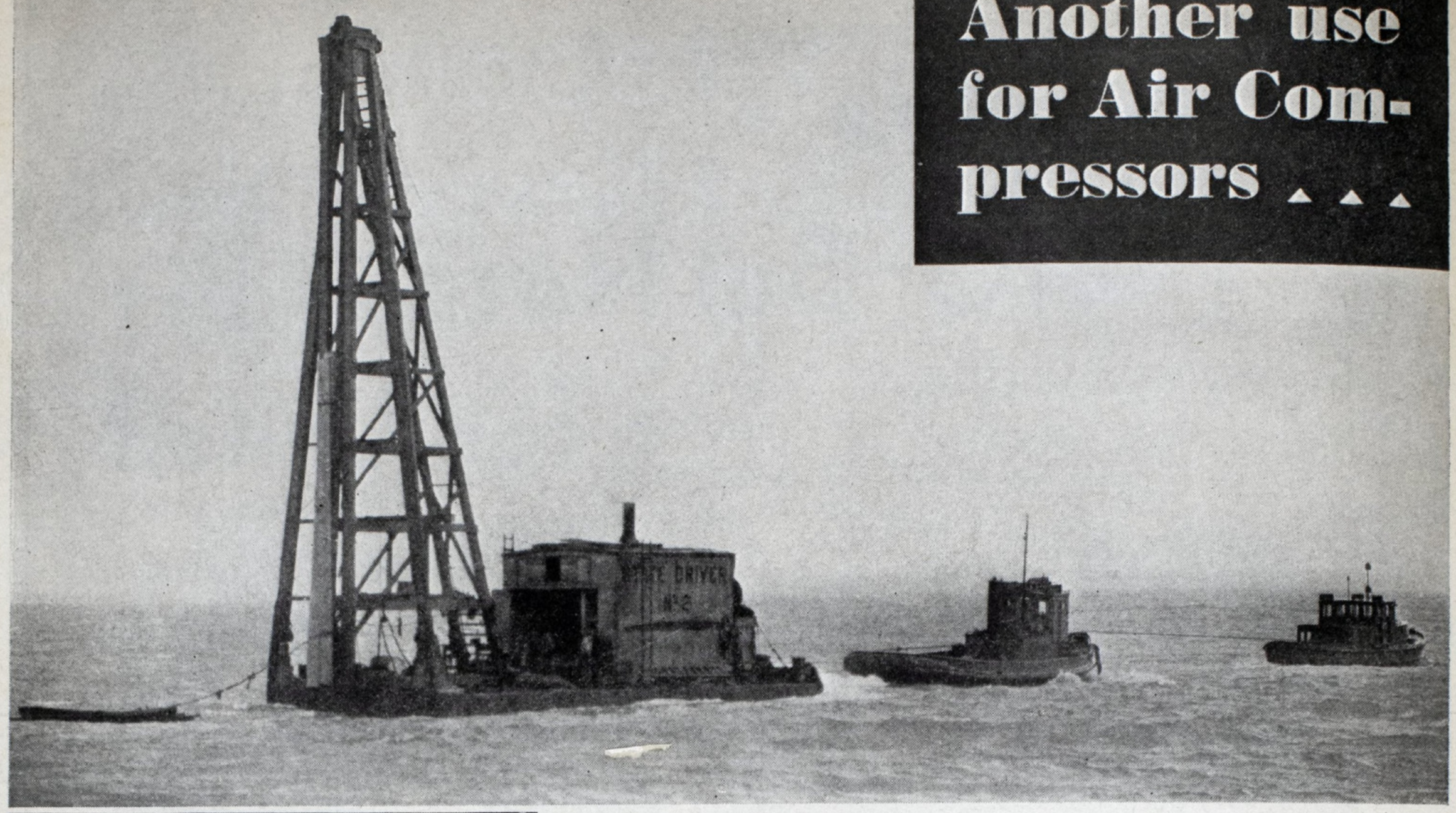

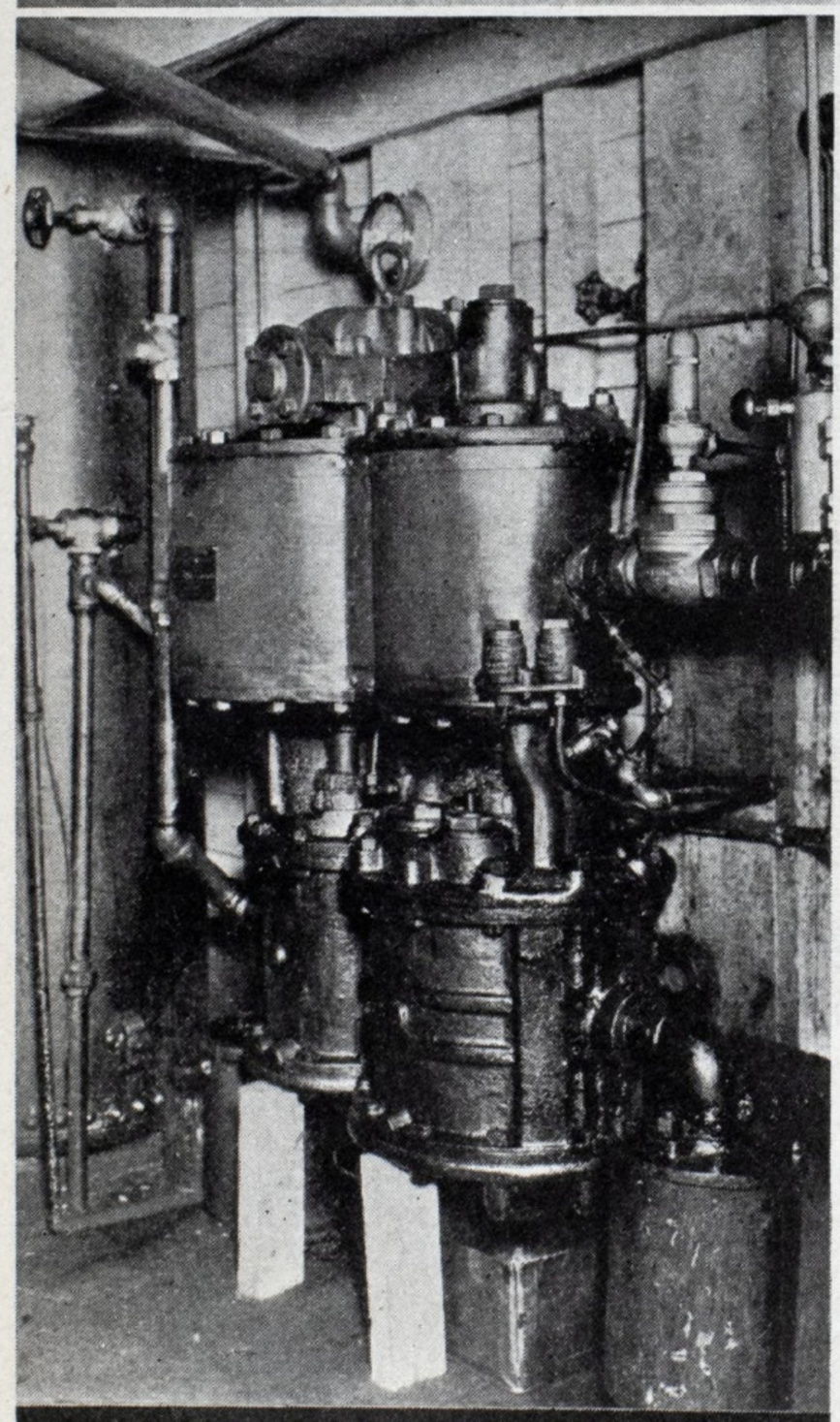

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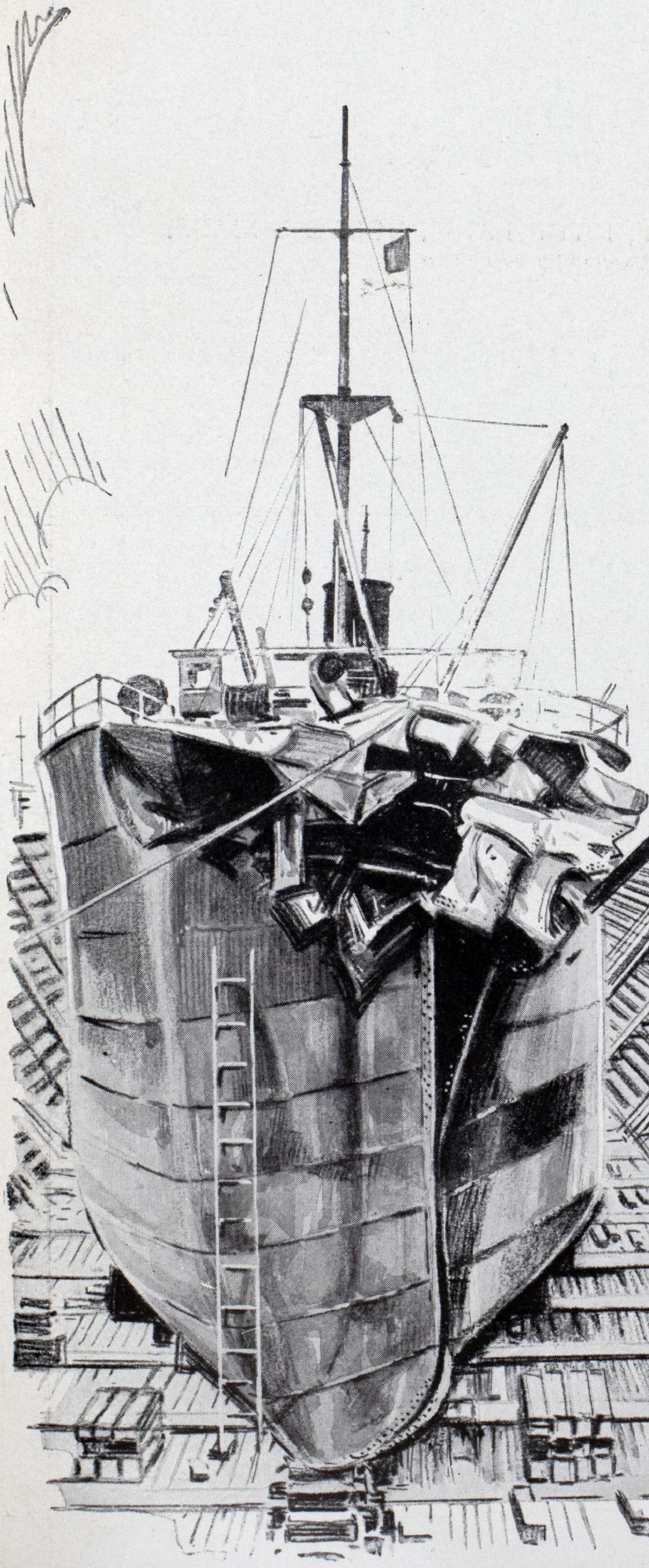
WESTINGHOUSE-NATIONAL Air Compressors

"Quality Machines for Quality Service"

Ship repairs at Newport News



REGARDLESS the size of the job—whether it is serious bottom or bow damage, routine underwater work or voyage repairs, the resources, efficient organization and unlimited facilities at NEWPORT NEWS offer singular service for the repair of ships.

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Newport News Shipbuilding and Dry Dock Company

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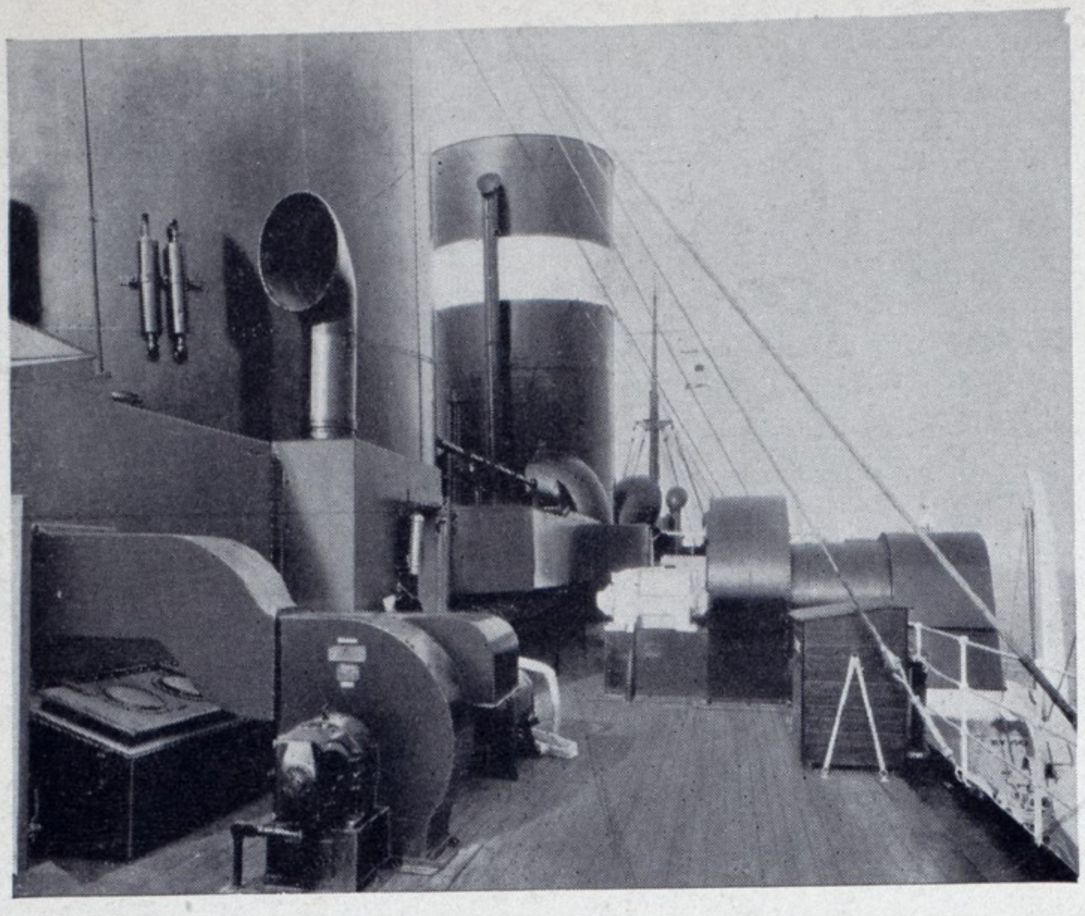

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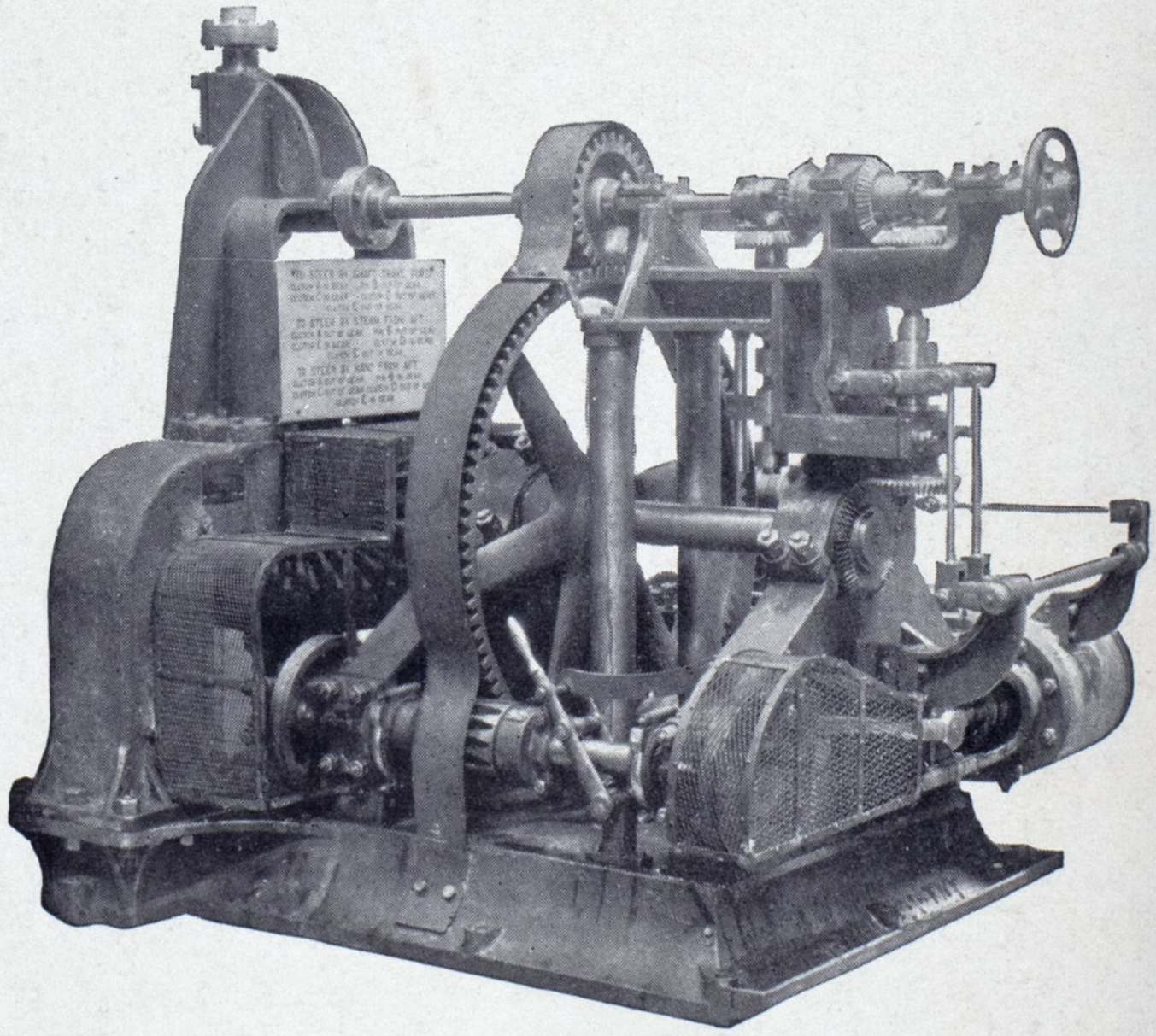

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